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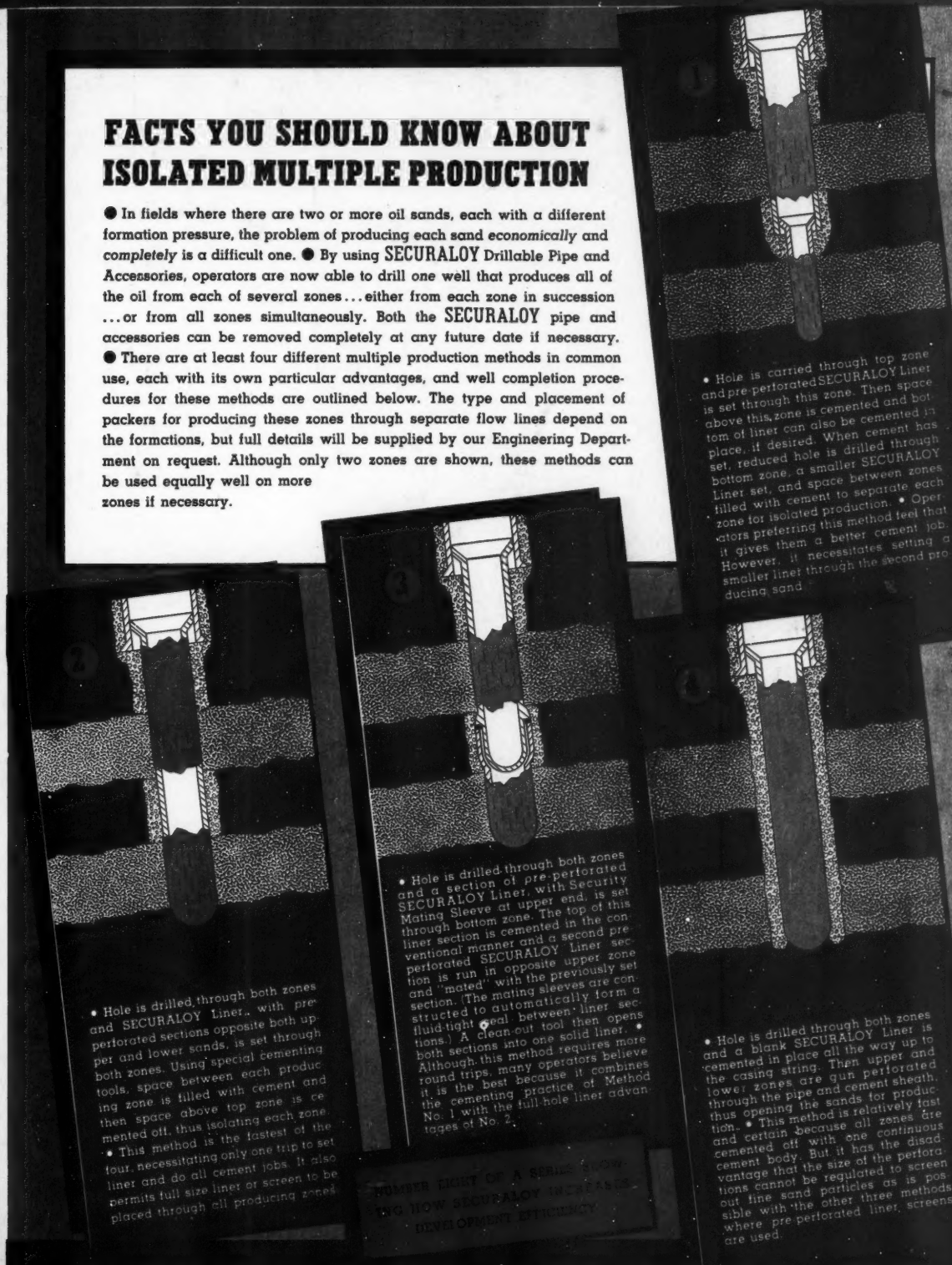
2
• Hole is drilled through both zones and SECURALOY Liner, with pre-perforated sections opposite both upper and lower sands, is set through both zones. Using special cementing tools, space between each producing zone is filled with cement and then space above top zone is cemented off, thus isolating each zone. • This method is the fastest of the four, necessitating only one trip to set liner and do all cement jobs. It also permits full size liner or screen to be placed through all producing zones.
3
• Hole is drilled through both zones and a section of pre-perforated SECURALOY Liner, with Security Mating Sleeve at upper end, is set through bottom zone. The top of this liner section is cemented in the conventional manner and a second pre-perforated SECURALOY Liner section is run in opposite upper zone and "mated" with the previously set section. The mating sleeves are constructed to automatically form a fluid-tight seal between liner sections.) A clean-out tool then opens both sections into one solid liner. • Although this method requires more round trips, many operators believe it is the best because it combines the cementing practice of Method No. 1 with the full-hole liner advantages of No. 2.
NUMBER EIGHT OF A SERIES SHOWING HOW SECURALOY INCREASES DEVELOPMENT EFFICIENCY
1
• Hole is carried through top zone and pre-perforated SECURALOY Liner is set through this zone. Then space above this zone is cemented and bottom of liner can also be cemented in place, if desired. When cement has set, reduced hole is drilled through bottom zone, a smaller SECURALOY Liner set, and space between zones filled with cement to separate each zone for isolated production. • Operators preferring this method feel that it gives them a better cement job. However, it necessitates setting a smaller liner through the second producing sand.
4
• Hole is drilled through both zones and a blank SECURALOY Liner is cemented in place all the way up to the casing string. Then upper and lower zones are gun perforated through the pipe and cement sheath, thus opening the sands for production. • This method is relatively fast and certain because all zones are cemented off with one continuous cement body. But it has the disadvantage that the size of the perforations cannot be regulated to screen out fine sand particles as is possible with the other three methods where pre-perforated liner screens are used.

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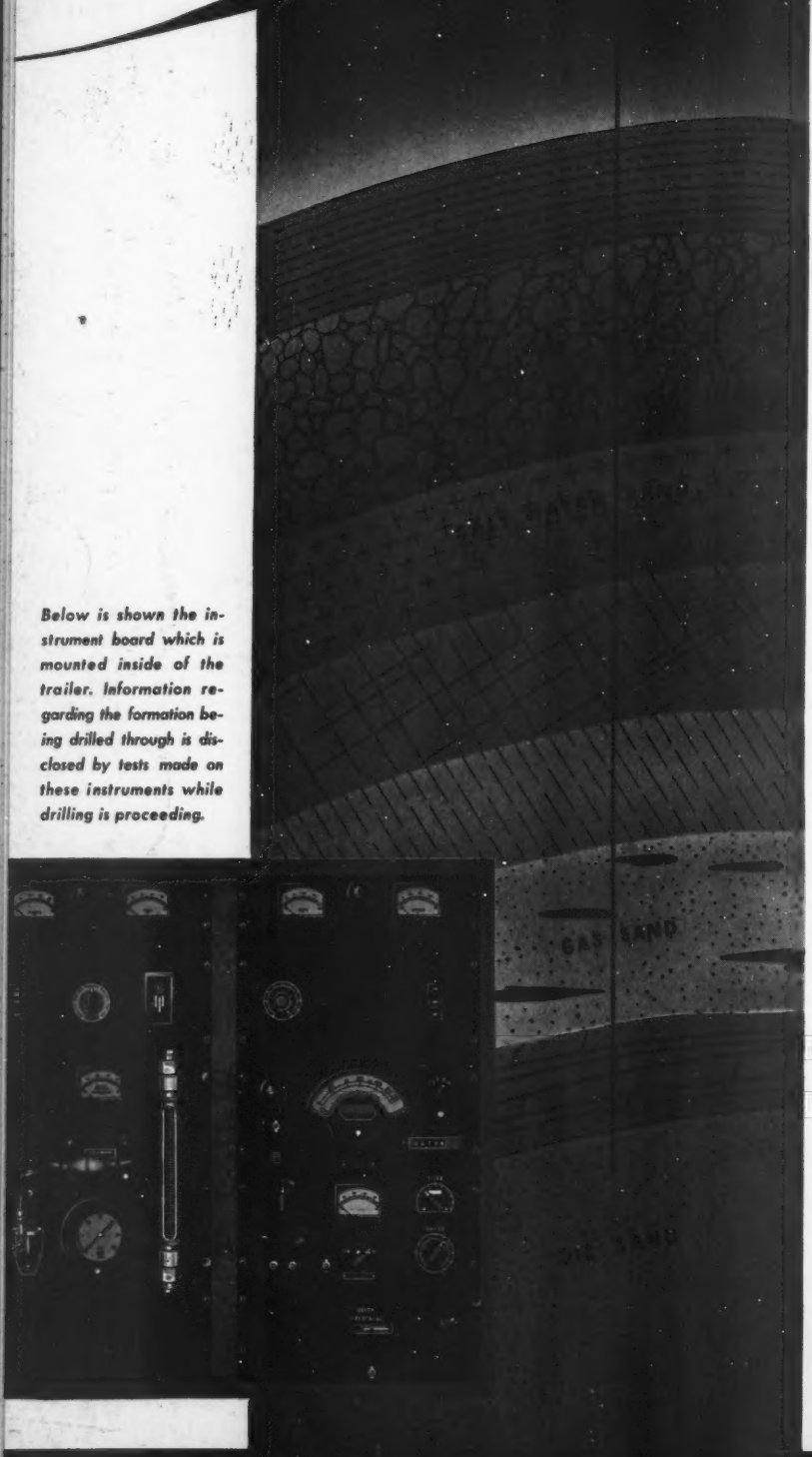

*Below is shown the instrument board which is mounted inside of the trailer. Information regarding the formation being drilled through is disclosed by tests made on these instruments while drilling is proceeding.*



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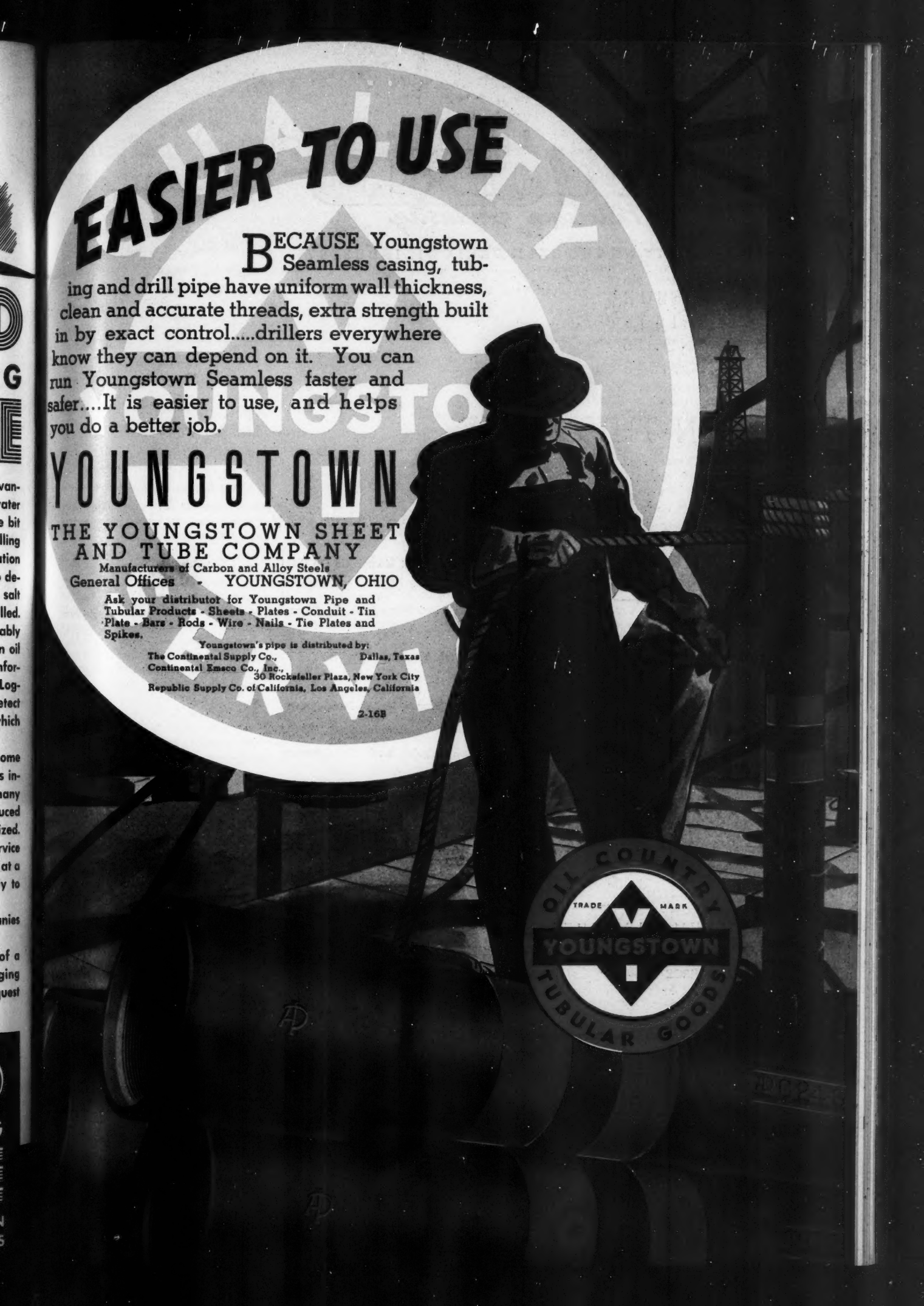
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# OIL WORLD
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THE AUTHORITY ON THE CALIFORNIA OIL INDUSTRY

SECOND ISSUE
AUGUST 1939
VOL. 32 » NO. 16
WHOLE NO. 1543

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California Oil World and Petroleum Industry is published twice a month at 828 Petroleum Securities Bldg., 714 West Olympic Blvd., Los Angeles, California. Entered as Second-class Matter January 1, 1937, at the post office at Los Angeles, California, under the Act of March 3, 1879. Subscription price: $1 per year in U. S. and Possessions, $2 in foreign countries, including Canada. Member of the Audit Bureau of Circulations.

August 25, 1939

Telephone Number Richmond 2136

# Internal Combustion Engine Jacket Cooling

## With Novel Vapor Phase Method

By

J. H. Wallace and R. A. Newton of Pacific Enterprise Products, Inc.

Vapor-Phase Cooling is the name applied to a novel method of jacket cooling for internal combustion engines. Since the Vapor-Phase system is merely a means to an end, that is removing waste heat from the jackets, and since its advantages or disadvantages, as the case may be, are directly related to the thermal conditions within the cylinder, we will make a brief review and analysis of these conditions.

### Temperatures of the Cycle

In dealing with the thermal conditions of the cycle we are considering only four cycle, explosion type engines, although the same general principles will hold true in the two cycle engine and in engines of the diesel type.

Plate No. 1 is a graphic representation of the combustion within a typical four cycle explosion type cylinder. The lower curve shows pressure-time relationships, while the upper curve shows the temperature-time relationships within the cylinder. In the case of the temperature curve, the intake air is assumed to be at 60° F. or 519° Abs. In general the temperatures will, therefore, be approximately as follows for full load—approximately 100 lbs. B.M.E.P.

**TABLE I**

| | Deg. F. | Deg. Abs. |
|---|---|---|
| Intake Air | 60 | 519 |
| End of Suction | 155 | 614 |
| End of Compression | 800 | 1260 |
| Firing | 4000 | 4459 |
| End of Expansion | 2588 | 3047 |
| End of Exhaust | 1641 | 2100 |

The average mean temperature between combustion and expansion is approximately 3800° Abs. or 3340° F.

### Heat Distribution

Of the total heat units in the fuel, the approximate distribution is as follows, assuming 11,000 B.t.u. per full load H.P.

**TABLE II**

| | % | B.t.u. |
|---|---|---|
| To Brake Horsepower | 26 | 2860 |
| To Engine Friction | 6 | 660 |
| To Radiation | 6 | 660 |
| To Exhaust | 34 | 3760 |
| To Jacket Water | 28 | 360 |
| | 100 | 11,000 |

Note: This approximate distribution applies to engines between 4 and 6" bore and operated at speeds of approximately 1000 piston feet per minute and mean effective pressures of approximately 80 lbs., and with air-cooled manifolds. This balance varies somewhat for slow speed engines and in general the amount of heat rejected to the cooling water increases with the diameter of the bore and the decrease in speed of the engine. In the case of extremely slow speed engines, the total rejected to the jackets may be 35%.

Of the above 28% shown as rejected to cooling water, the amounts rejected during the different parts of the cycle are as follows:

**TABLE III**

| | % of total | % of jacket heat |
|---|---|---|
| Combustion, to the Head | 6 | 21 |
| Expansion, to the walls and head | 7 | 25 |
| Exhaust, to walls and head | 15 | 54 |
| | 28 | 100 |

### Wall Temperatures within the Combustion Chamber

Various observers show metal temperatures running from 300° to 450° F. on the surface of the metal of the combustion chamber, and dropping almost immediately to approximately water temperatures in the lower cylinder walls. It can also be proved analytically that it is impossible for the wall temperatures to exceed the boiling point of the liquid by more than 50° to 75° F. (Ref. "Heat Transfer in Evaporation and Condensation," by Max Jakob, Mech. Eng., October, 1936). It can also be shown that due to heat concentration of from 50,000 to 150,000 B.t.u. per square foot per hour which occur in the upper combustion chamber, the water can only remove this heat by ebullition on the water surface of the metal. Water can only absorb between 200 and 250 B.t.u. per square foot per degree Fahrenheit per hour under the best of conditions, and the necessary rate (allowing 20° F. differential for the water) is from 10 to 15 times this amount. Therefore, the upper jackets and the heads are at boiling temperature regardless of the temperatures of the main body of water.

It is frequently assumed that the lower the jacket water temperature, the greater the rate of heat transfer through the head walls and liner walls. However, Ricardo shows the following conditions to exist:

**Condition No. 1—220°F. Jackets**

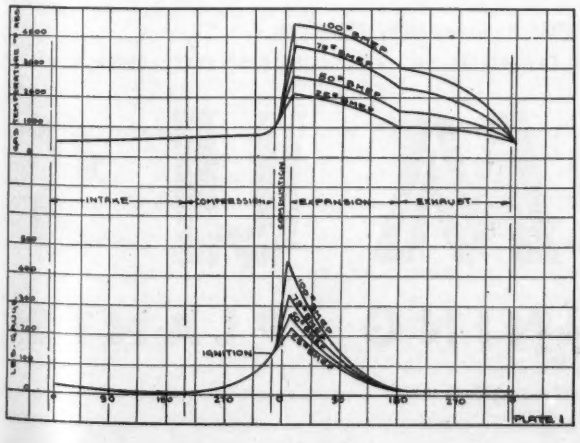
| | |
|---|---|
| Average gas temperature of combustion chamber | 3300°F. |
| Jacket Temperature | 220°F. |
| Difference | 3080°F. |

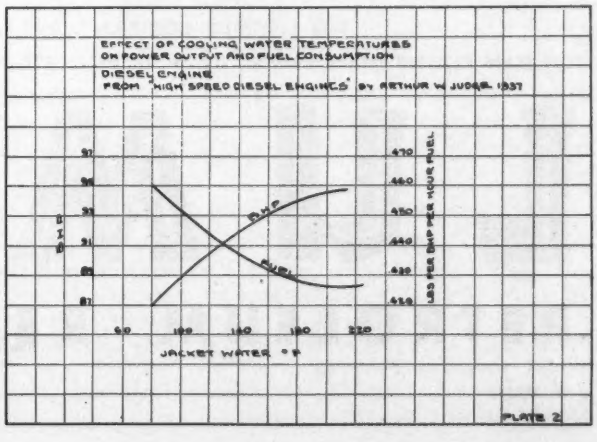
**Condition No. 2—70° F. Jackets**

| | |
|---|---|
| Average gas temperature of combustion chamber | 3300°F. |
| Jacket Temperature | 70°F. |
| Difference | 3230°F. |

| | |
|---|---|
| Gradient Condition No. 2 | 3230°F. |
| Gradient Condition No. 1 | 3080°F. |
| Gradient Differential | 150°F. |

Since the rate of heat flow is directly proportional to the differential, the in-





EFFECT OF COOLING WATER TEMPERATURES ON POWER OUTPUT AND FUEL CONSUMPTION
DIESEL ENGINE
FROM "HIGH SPEED DIESEL ENGINES" BY ARTHUR W. JUDGE. 1937
BHP
FUEL
JACKET WATER, °F
PLATE 2

Among plants now under construction by Lummus is an interesting Dubbs combination cracking-coking unit for Shell's Wood River, Illinois refinery. » » » Designed to handle 18,000 barrels of reduced crude per day, this plant is equipped with Lummus steam generation for 24,000 pounds per hour of 170 pound 100° superheat steam.

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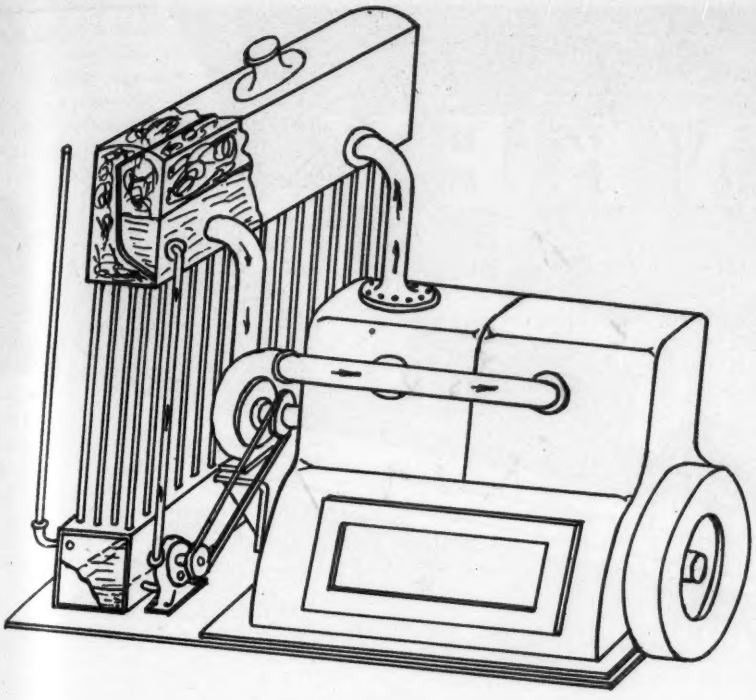


RADIATOR TYPE VAPOR PHASE SYSTEM

crease in rate from 220° jackets to 70° jackets would be

$$\frac{3230}{150} = 2.15\%$$

However, we have shown above that the liner temperature cannot be less than 212° regardless of the jacket water temperature; therefore, the assumed condition of 70° jackets can never exist.

The above conditions, however, exist only through that portion of the stroke which accounts for approximately 13% of the total heat distribution to the jackets, so again it can be seen that jacket water temperature alone has little or no effect on either the rate of heat absorption by the jacket water or upon the maximum temperature of the combustion chamber.

The surface temperatures of the liners and heads, it has been shown, are not greatly affected in the points of high heat concentration by the temperature of the water. Of far greater consideration is the condition of the head and liner surface. Slight, almost microscopic films of scale, oil or grease raise the surface temperatures from 20° to 100°.

### Liner Distortion

Let us assume a conventional engine with jacket water entering at 120° F. and leaving at 140° F. The upper portion of the combustion chamber consisting of the heads and upper one-fourth of the liner will have an inside temperature of approximately 312° F. with a water temperature of 212° F., or an average temperature of 267° F. whereas the lower section of the liner will have a temperature of approximately 130° F., or a total temperature difference in the length of the liner of 137° F. Should, however, the jacket water enter at 210° and leave at 230°, the average temperature of the lower liner would be 220° or a total difference of 56°. Since the distortion of the liner is directly proportional to the temperature difference, it is apparent, therefore, that under this latter condition there will be less than one-half the normal liner distortion or taper due to temperature.

### Thermal Efficiency of the Carnot Cycle

The thermal efficiency of the Carnot cycle is the ratio of the total heat units available in the fuel which can be transferred into mechanical energy. Since all temperatures so far as thermal calculations are concerned are taken from absolute zero, it is obviously theoretically impossible to have any engine 100% efficient. In order for such a theoretical condition to exist, it would be necessary for the final temperatures of the complete cycle to be minus 459° F. Therefore, the maximum theoretical efficiency would be when all conditions returned to the normal temperature which we assume for most calculations to be 60° F., or 519° Abs. Solving for this value where E is Thermal Efficiency, $T_1$ is the Initial Temperature, and T is the Final Temperature, the equation then is

$$E \text{ equals } 1 - \frac{T_1}{T}$$

Assuming $T_1$ is 60° F. or 519° Abs. and T is 1617° F. or 2076° Abs., we get

$$E \text{ equals } 1 - \frac{519}{2076}$$

or

$$1 - \tfrac{1}{4} \text{ equals } .75 \text{ or } 75\%.$$

Therefore, the maximum efficiency which could be reached would be only 75% and this assuming a frictionless engine with no heat loss and final exhaust temperatures of 60° F.

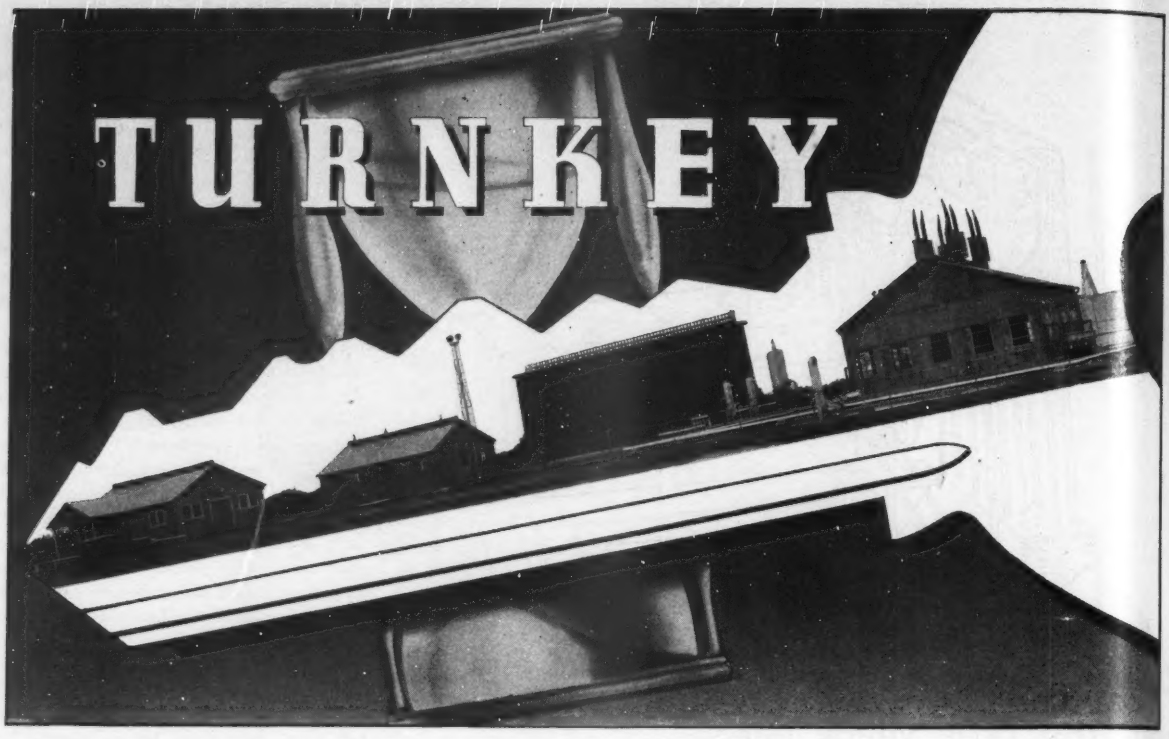
The only method of increasing this efficiency would be to increase the maximum temperature T which is done in the case of supercharged engines. It is frequently erroneously assumed that the loss of heat to the jackets represents a real loss in thermal efficiency. This, however, is not the case, for a large part of the heat that goes to the jackets goes after the piston is in a position where no useful work can be performed. Referring again to Table III of jacket water heat distribution, it will be seen that 13% is dissipated during the combustion and expansion stroke, the latter half of which stroke is of little mechanical value. Therefore, let us assume that all jacket water heat dissipation was eliminated. Available then for useful work would only be the 6% during combustion and approximately 4% during expansion making a total of 10% of the total available heat even with these impossible conditions which assume wall temperatures of 3800° F. Actual savings can be shown to be in the neighborhood of ½ of 1%. Thus it can be seen that the rate of jacket water heat dissipation is of little consequence in the thermal efficiency.

### Effect of Temperature on Mechanical Efficiency

The fact that there is an apparent increase in efficiency on the dynamometer is due to the reduction of mechanical losses due to piston drag. Ricardo shows that the difference in effective brake horsepower output of the conventional type of engine may vary approximately 8 to 10% with the change in jacket temperature. In other words, approximately 10% more useful work can be obtained with high jacket temperatures which reduce oil drag. See Plate No. 2.

### Effect of Temperature on Volumetric Efficiency

Volumetric efficiency is affected by the temperatures of the gases during the suction stroke. In the case of gasoline engines it is necessary to heat the induction system for the purpose of volatilizing the fuel with consequent loss in volumetric efficiency. In the case of

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engines using a gaseous fuel such heating of the induction system is unnecessary; therefore, greater volumetric efficiency is obtainable. The effect on the volumetric efficiency is approximately proportional to the temperature of the air in the induction system and the entering air. The possible difference between the air and gas entering at say the maximum jacket temperature (212°) and the available ambient air temperature (60°) is approximately 5%. It would, therefore, seem that with the average natural gas engine, the greatest possible volumetric loss would be 5% with a mechanical gain of approximately 8% leaving a net gain for high temperature jackets of approximately 3% which again is a negligible quantity. The volumetric efficiency will affect only the maximum B.M.E.P., and since most engines operate below their maximum, it is of no consequence.

### Products of Combustion

Practically all explosion type engines utilize hydrocarbons for fuels. During combustion the carbon burns to carbon dioxide and carbon monoxide, the hydrogen to water and the sulphur to sulphur dioxide. Table IV illustrates the products of combustion of three typical types of fuels, namely: gasoline, California natural gas, and sewer gas. The latter is composed of approximately 90% methane, .5% to 1.5% sulphur in the form of hydrogen sulphide, and the balance carbon dioxide, carbon monoxide, nitrogen and other hydrocarbons. The figures for sewer gas are based on methane. Of the products of combustion we are concerned primarily with water and sulphur dioxide. We all realize that a large amount of water is formed, but few of us give enough weight to this item. As shown on the table, there is approximately one gallon of water per 10 brake horsepower hours. When we consider this amount of water which is in the form of steam in the combustion chamber, we realize that the internal combustion engine is a partial steam engine. The bearing that this water has upon the mechanical life of the engine and upon the lubricating oil condition is of the utmost importance.

It is frequently assumed that this water passes out the exhaust as steam. Such, however, is not entirely true. A portion may be deposited on the cylinder walls depending upon their temperature and the pressure within the engine. "When a gas containing liquid vapor comes into contact with a surface at or below the dew point temperature of the vapor, the vapor will condense upon the surface regardless of the temperature of the gas."

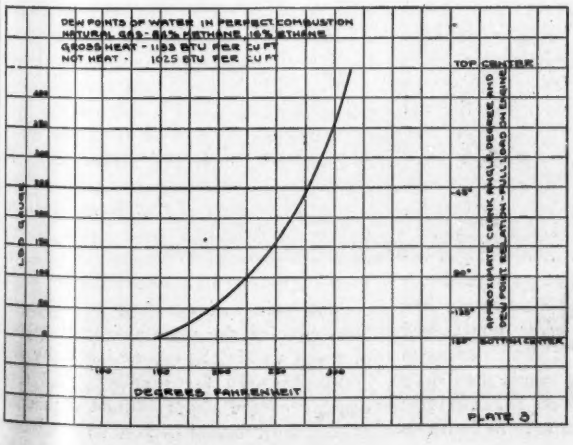
It is, therefore, evident that an analysis of the dew points of the products of combustion is essential. Plate No. 3 shows the curve for dew point temperatures and pressures of the average products of combustion of natural gas.

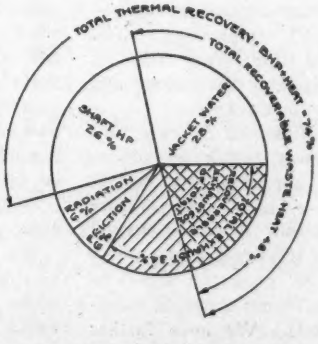
### Effect of Jacket Temperature on Moisture Condensation

It becomes apparent then that as the piston descends, the products of combustion containing water come into contact with a surface which is equal to or lower than the dew point. Under these conditions condensation takes place upon the liner walls. At the bottom of the expansion stroke when the piston starts up, the temperatures are still further lowered and the deposited moisture remains on the walls to be scraped off by the piston ring and intimately mixed with the film of oil forming an emulsion, and the subsequent firing causes blow-by driving this mixture of water and oil (sludge) down into the crankcase from where it is difficult to remove. In addition, practically all hydrocarbons contain small amounts of sulphurous compounds which burn to sulphur dioxide, in itself harmless, but having an affinity for moisture. Hence, as the moisture is deposited upon the walls such sulphur dioxide as may be present is immediately absorbed by the water forming sulphuric acid. Not only is this sulphuric acid harmful to the liners, rings and pistons, but it is an ideal emulsifying agent and tends to form an extremely stable emulsion. Experience with engines operating on sour gas (gas containing a fairly large percentage of sulphur dioxide, etc.) has shown that severe sludging takes place. This sludge in addition to destroying the lubricating properties of the oil causes gumming and sticking of the rings, fouling of the oil passages, and also acts upon the bearing surfaces, etching and corroding them. The action of engines operating on sour gas is merely the accelerated action that would take place in normal natural gas burning engines, but over a considerably longer period of time. We have found that by increasing the jacket water temperature less sludge results. Some have attributed this reduced sludging to increased crankcase temperature, it being argued that at the higher temperatures the water is, or tends to be, removed from the crankcase through the breathers. While increased crankcase temperatures may tend to have this action, it is our opinion that it is of negligible value and that the decreased sludging from engines operating at higher temperatures comes almost entirely from the fact that less moisture is deposited on the cylinder walls, and hence less moisture is present in the crankcase.

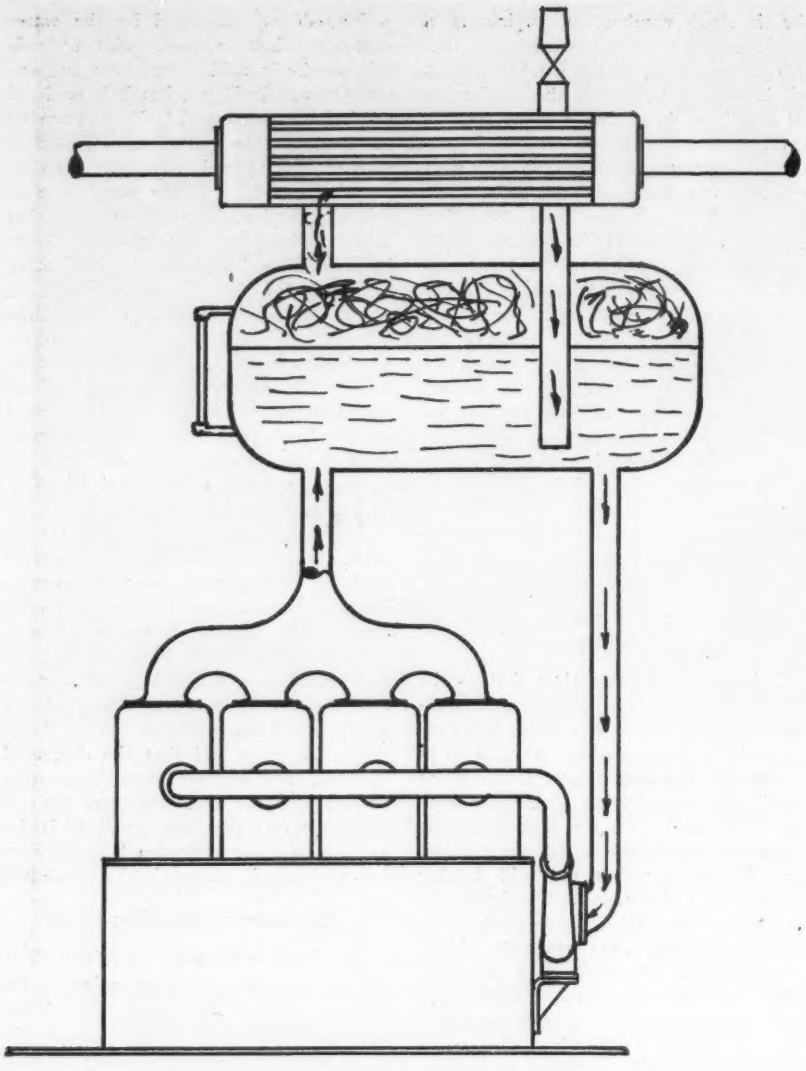
### Summary of Heat Conditions

We have attempted to show first, what actual temperatures exist in the various parts of the cycle; second, the heat distribution or in what manner the heat taken in as fuel is distributed to useful and to waste energy; third, what wall temperatures actually exist; fourth, the effect of varying jacket water temperatures on the thermal, mechanical and volumetric efficiencies, and fifth, what products result from combustion and their effect upon the engine.


DEW POINTS OF WATER IN PERFECT COMBUSTION
NATURAL GAS - 84% METHANE, 16% ETHENE
GROSS HEAT - 1133 BTU PER CU FT
NET HEAT - 1025 BTU PER CU FT
TOP CENTER
BOTTOM CENTER
DEGREES FAHRENHEIT
PLATE 3




HEAT DISTRIBUTION SHOWING POSSIBLE HEAT RECOVERY
PLATE



LIQUID COOLED VAPOR PHASE SYSTEM

To summarize briefly, we find that we have combustion temperatures of approximately 4,000° F. with a mean temperature during the combustion and exhaust period of approximately 3,300° F., that of the total heat content of the fuel approximately 26% represents sh horsepower, 40% represents friction, radiation and jacket dissipation and 34% represents exhaust waste.

We have also attempted to show that with cooling jacket water at atmospheric pressure, approximately 300° F. is the maximum metal temperature which exists within the combustion chamber, and that this temperature drops within the first 30° of piston travel to approximately the mean water temperature of the jackets. We have further shown that the mechanical distortion of the liners is approximately one-half where the entering water is at the boiling point.

We have also shown the effect of varying water temperatures on the thermal, mechanical and volumetric efficiencies, and find that the effect of jacket temperatures can only raise thermal efficiency at best by 1%, that mechanical efficiency can be increased from 5 to 10% due to decreased piston drag, and that the volumetric efficiency is decreased approximately 5%. Therefore, the net gain in overall efficiency due to high temperatures can at best not exceed 3 or 4% at full load. At partial loads, however, the net gains are surprisingly high, due primarily to less oil drag.

We have pointed out that the gas engine burning the average fuel produces water at the rate of approximately one gallon per ten horsepower hours, and this water can be and is deposited upon the liner walls when temperatures drop below the dew point of the mixture; such water deposited upon the walls is responsible for the breakdown of the lubrication film, crankcase sludge and water in the crankcase, and also that since most hydrocarbon fuels contain small percentages of sulphur compounds, this sulphur when burned, and in connection with water forms sulphuric acid, which not only acts upon the metallic surfaces, but aids in forming a stable emulsion of oil and water.

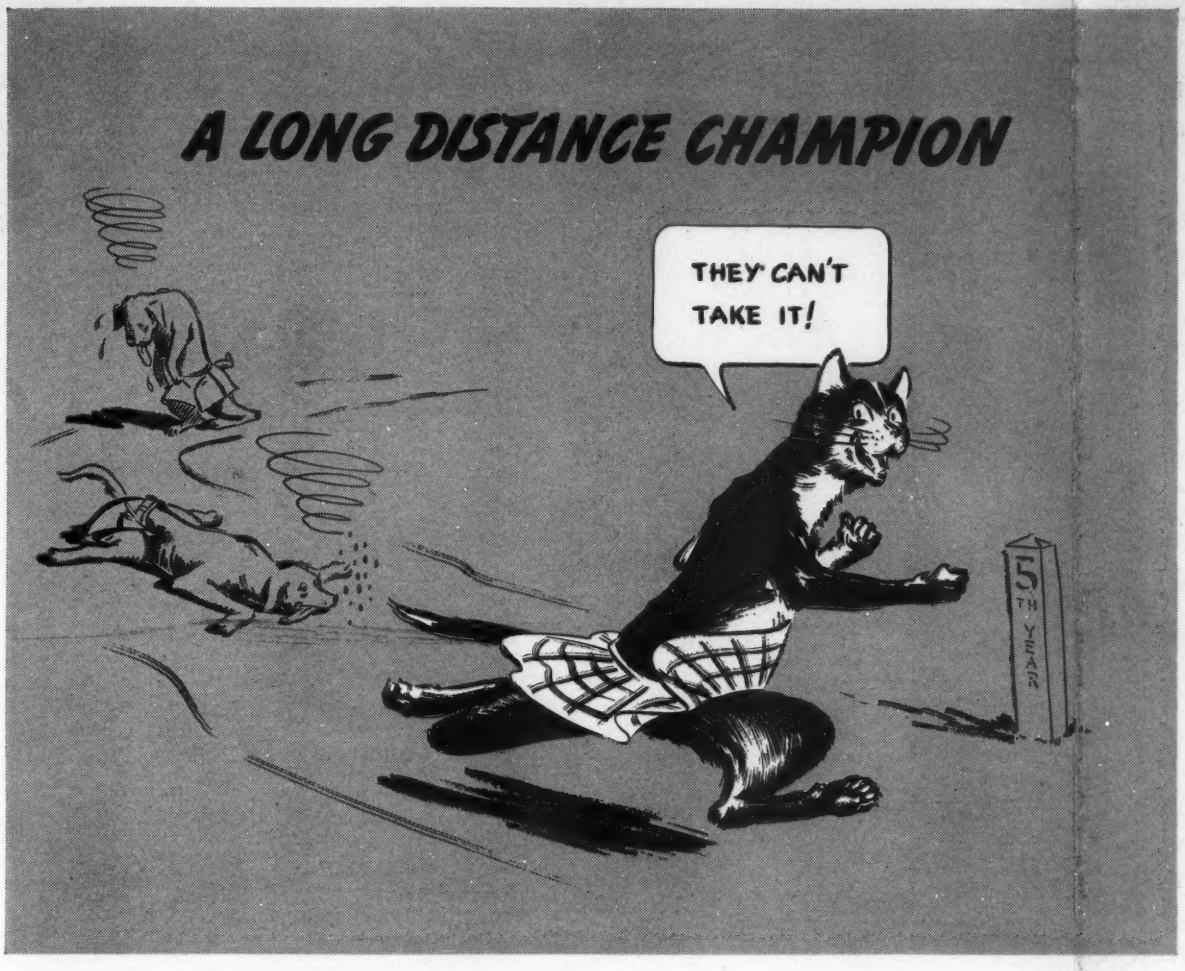
**What Jacket Water Temperature?**

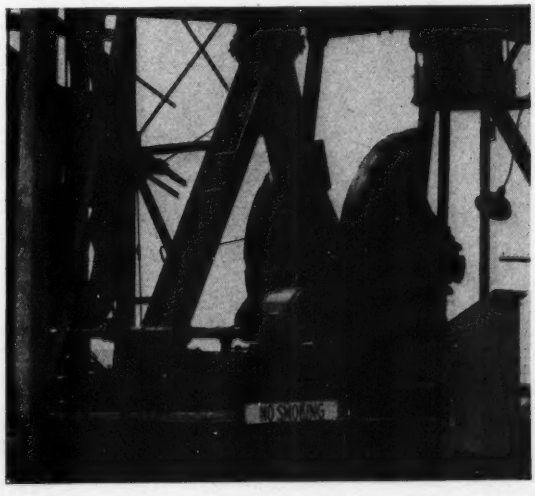
All of the above factors have been considered merely with a view to answer the question, "What jacket water temperature?" For a number of years users of internal combustion engines have realized the importance of increased engine temperatures and numerous devices have been resorted to, such as blocking thermostats, by-pass thermostats, thermostatically controlled shutters, thermostatically operated fans, and manual shutter controls. Of these the only systems which have gained much use have been the thermostats in the circulating water system. In the case of a purely blocking type of thermostat, the jacket temperature at discharge is maintained high, but a small amount of water is cooled and admitted making the temperature gradient across the engine relatively high and producing low lower liner wall temperatures. Each of the systems has very definite advantages and all tend toward high jacket temperatures.

However, to be 100% effective, it is necessary that jacket temperatures be at about the boiling point of water or 212° F. It is impossible with a normal circulating system to arrive at these temperatures because of the constantly accumulating bubbles of steam which form a constant evaporative loss to the system and also which tend to be entrapped in the pump causing vapor lock with the resultant reduced rate of circulation and subsequent increase of steam formation. Further all automatic controls based on thermostats have been a source of continual mechanical trouble. While these systems are a great help, they leave much to be desired. Several systems have been devised to overcome certain of these difficulties. One method is to provide an auxiliary condenser to separate the steam formed from the water and let this condensed steam return to the system. This does away with difficulties of loss of water and pump lock, but temperature control must again depend upon the unreliable thermostat. Several systems known as evaporating or steam cooling have been developed. These systems involve the maintaining of a level of water within the engine jacket by divers means and the removing and condensing of the steam formed within the

(Continued on Page 16)

# ELECTRICITY AT WORK IN THE OIL FIELDS



*Royalty Service Corporation, Signal Hill. Ideco floor unit with V-belt drive, equipped with 25 horsepower motor.*

The prime mover for an oil well pump has a tough job. It has to take the same punishment your car would take if you drove it uphill for fifty, seventy-five or a hundred thousand miles every year. Electric motors can and do take that rough treatment, not for just two or three years, but for eight, ten, twelve and even more years—often . . . little or no repair expense.

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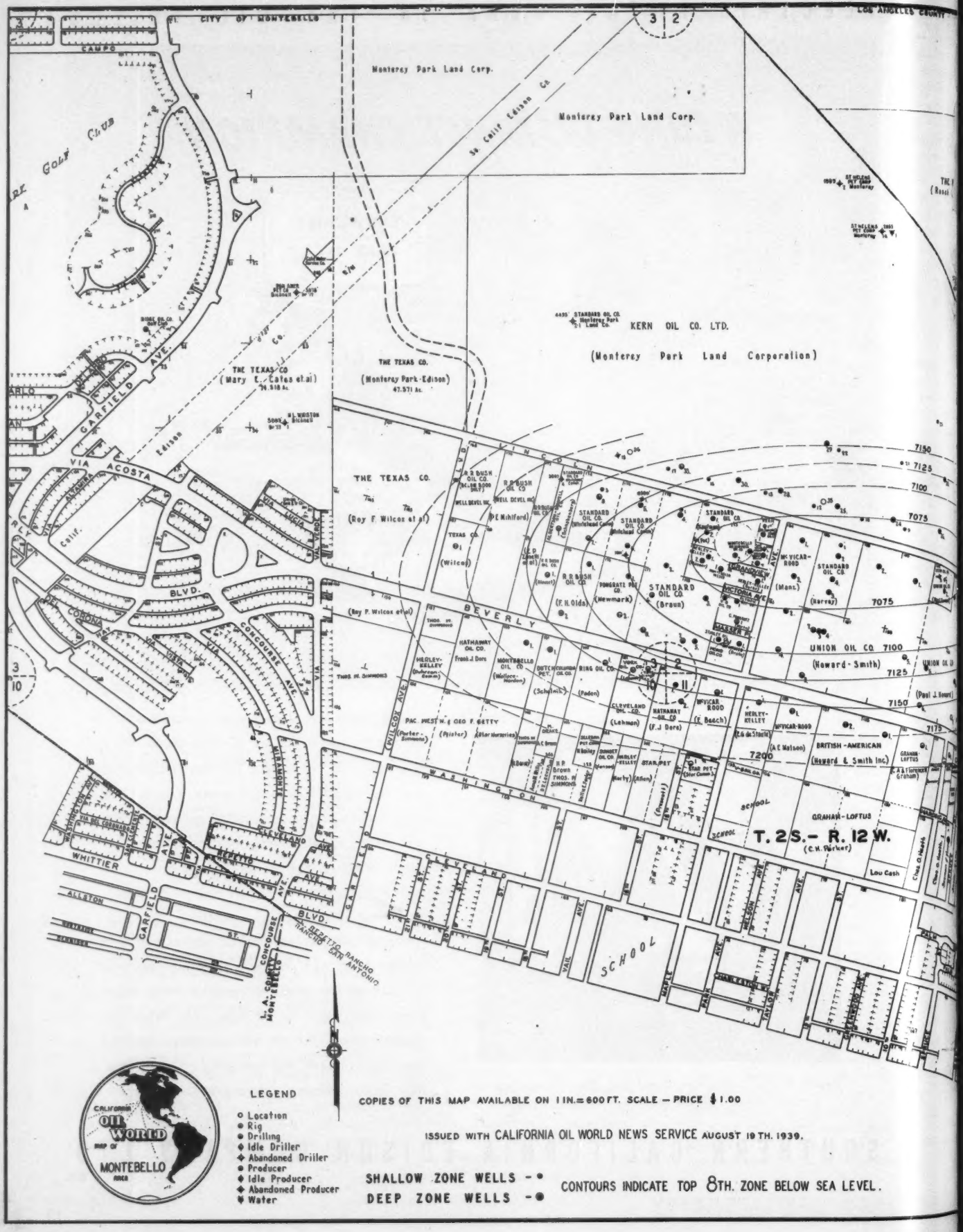
8-39







LEGEND

- ○ Location
- ● Rig
- ● Drilling
- ◆ Idle Driller
- ◆ Abandoned Driller
- ● Producer
- ◆ Idle Producer
- ◆ Abandoned Producer
- ↯ Water

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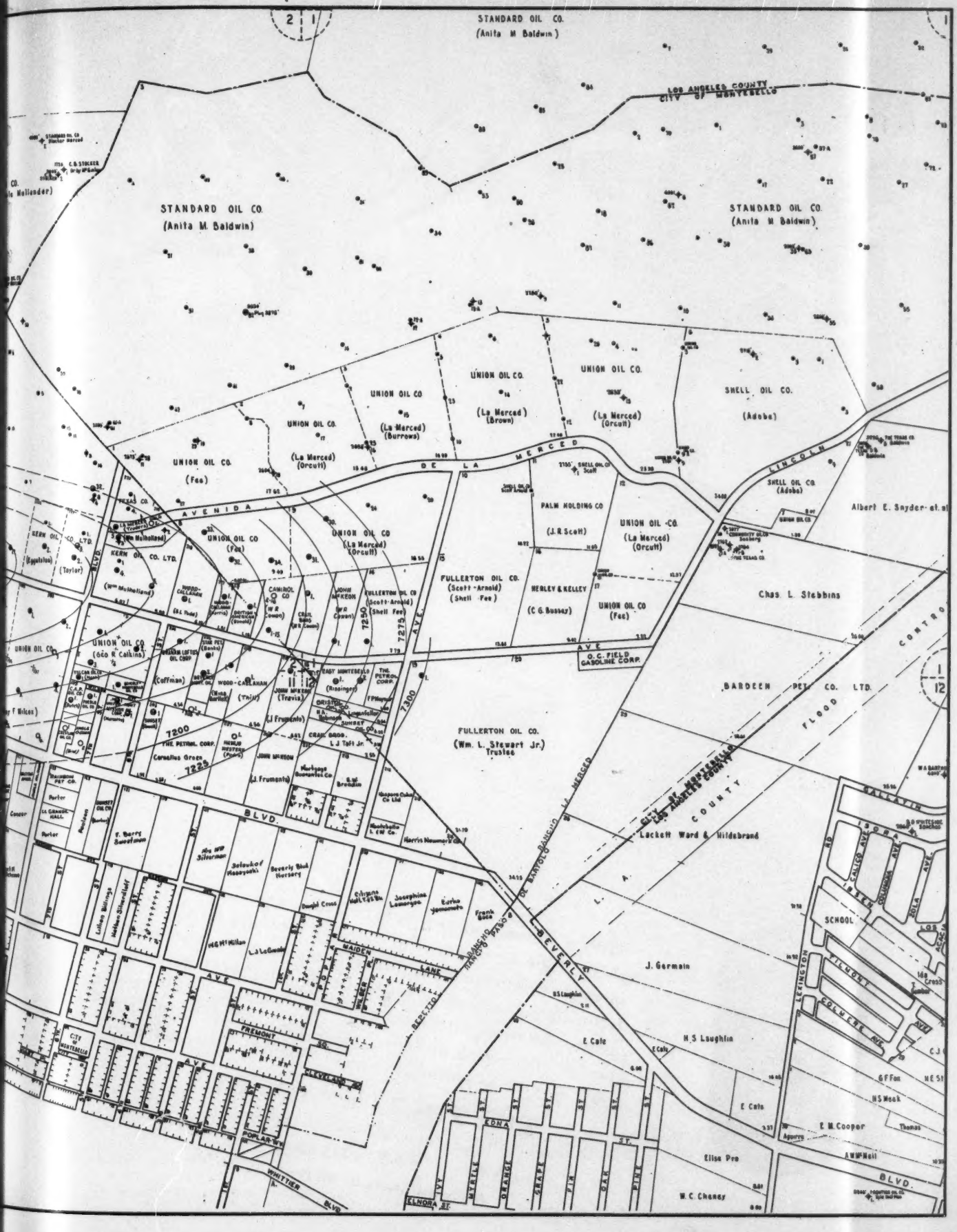
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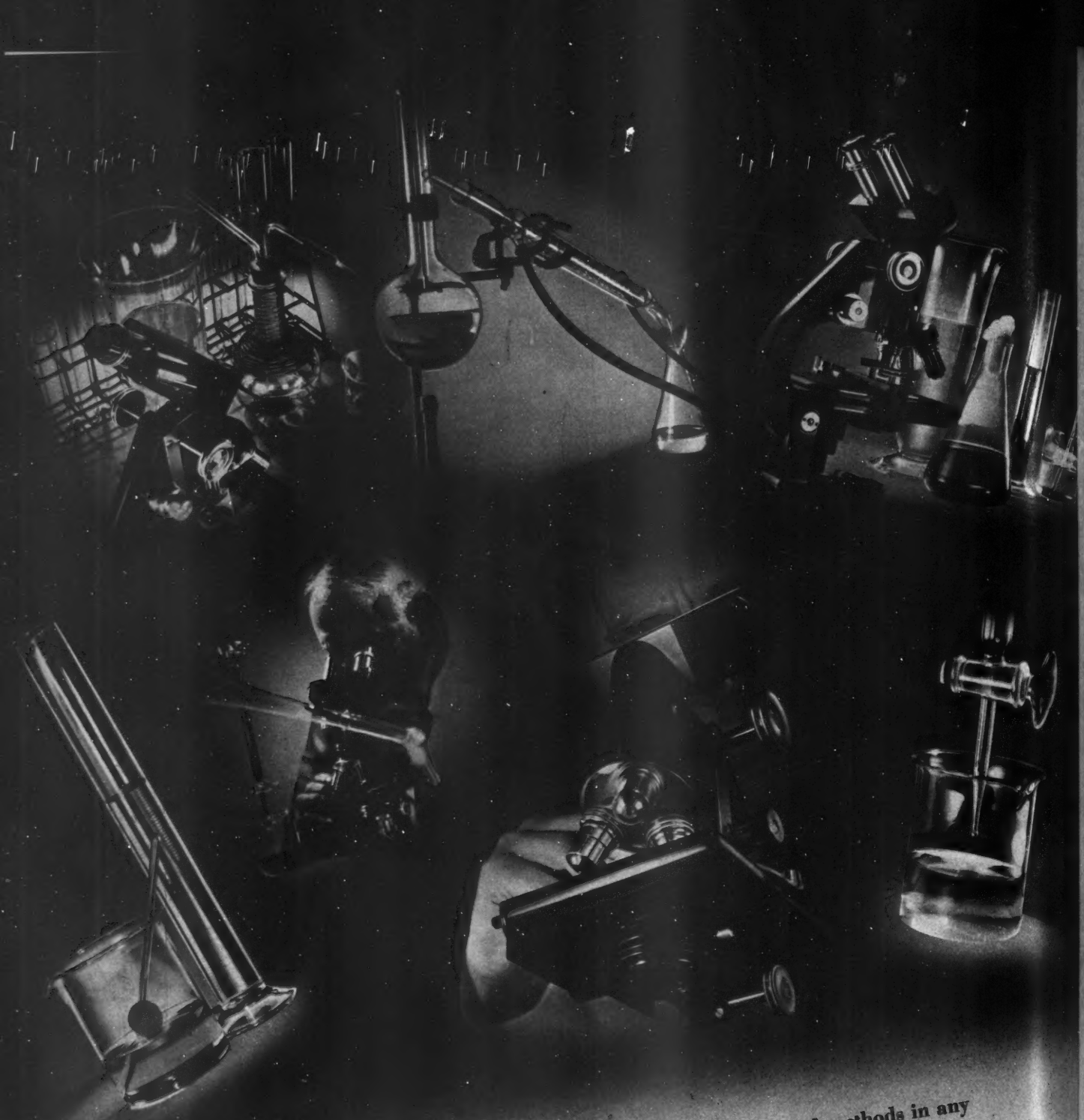

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## TRETOLITE COMPANY

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# New Plant Ready Oct. 1

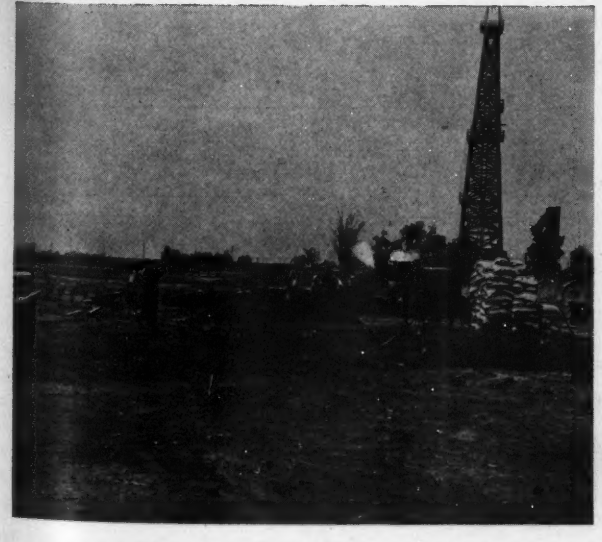
Fletcher Oil Co. is an "old timer" in handling petroleum products, and has operated a straightrun plant. So, when the company decided to build a refinery for the production of cracked and polymer gasoline, it was another indication that the day of the skimming plant operator is fast drawing to a close.

Below are two views of construction work on the Fletcher Oil Co.'s cracking and polymerization plant. Present plans call for a Dubbs cracking unit with a rated capacity of 1100 barrels a day of gas oil, or 1700 barrels a day of fuel oil, and an UOP non-selective catalytic polymerization unit with a rated capacity of 500,000 cu. ft. of gas a day. The design of the units is such as to provide for future increase in capacity.

The Fluor Corp., Ltd., the contractor, started work July 17, and will complete the plant Oct. 1. Design and specifications were furnished by Universal Oil Products.

Considered by "topping plant" operators as a costly venture, particularly in view of the fact that corrosion is combatted by the extensive use of chrome moly tubes, piping, valves and fittings, refinery experts contend that the Fletcher Oil Co.

(Continued on Page 28)



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# Mobile Derrick on Tideland Wells

One of the most interesting of field innovations is the mobile derrick arrangement used by Southwest Exploration Co. to service its Huntington Beach Tideland wells. As all of the company's wells are located in a straight line along the north side of Ocean Blvd., and because of the necessity for crowding, it was only logical to develop the program illustrated by the accompanying shots. Before drilling is started, foundations are laid for five wells exactly 24 ft. apart so that the drilling rig corners serve for two wells, the westerly corners of the most easterly well being utilized for the easterly corners of the next to the west, etc. After each well is completed the single drilling rig is skidded to its new location until five wells are drilled in a row, the limit of space available between the old Standard Oil Co. wells already on the property. Embedded in the long concrete foundation are steel rails passing directly through the rig corners which are removed as the drilling rig is moved to new locations. Travelling on these rails is an eighty-foot servicing derrick which is used to "pull" or otherwise service the entire group. Portable pumping units are rolled out of the way when the derrick on wheels is moved in.

The system enables the company to operate efficiently with a minimum of both drilling and servicing derricks.

Two jack screws take the weight off the small flanged wheel. The steel tie rod prevents derrick legs from spreading.

---

## Kelso Tests Puente Well

Last winter F. W. Kelso decided to drill a water well on his ranch located north of Valley Blvd. east of the town of Puente. Using a small cable tool rig, Mr. Kelso drilled several hundred feet without finding water, but being of a tenacious nature, he carried the hole on until, surprisingly, a few oil colors appeared in the bailings.

At this juncture the project began to arouse the entire countryside which has been oil minded for years as at least half a dozen oil tests have been drilled within a radius of a few miles—and all found good showings. Having arrived at the limit of the light rig, interested neighbors "kicked in" with enough financial help to install a small portable rotary outfit which took the hole down to 2188 ft. where the informal group of operators agreed showings were good enough to test. Accordingly, 6⅝ in. casing was cemented at 2020 ft. and a bailing trial is being made.

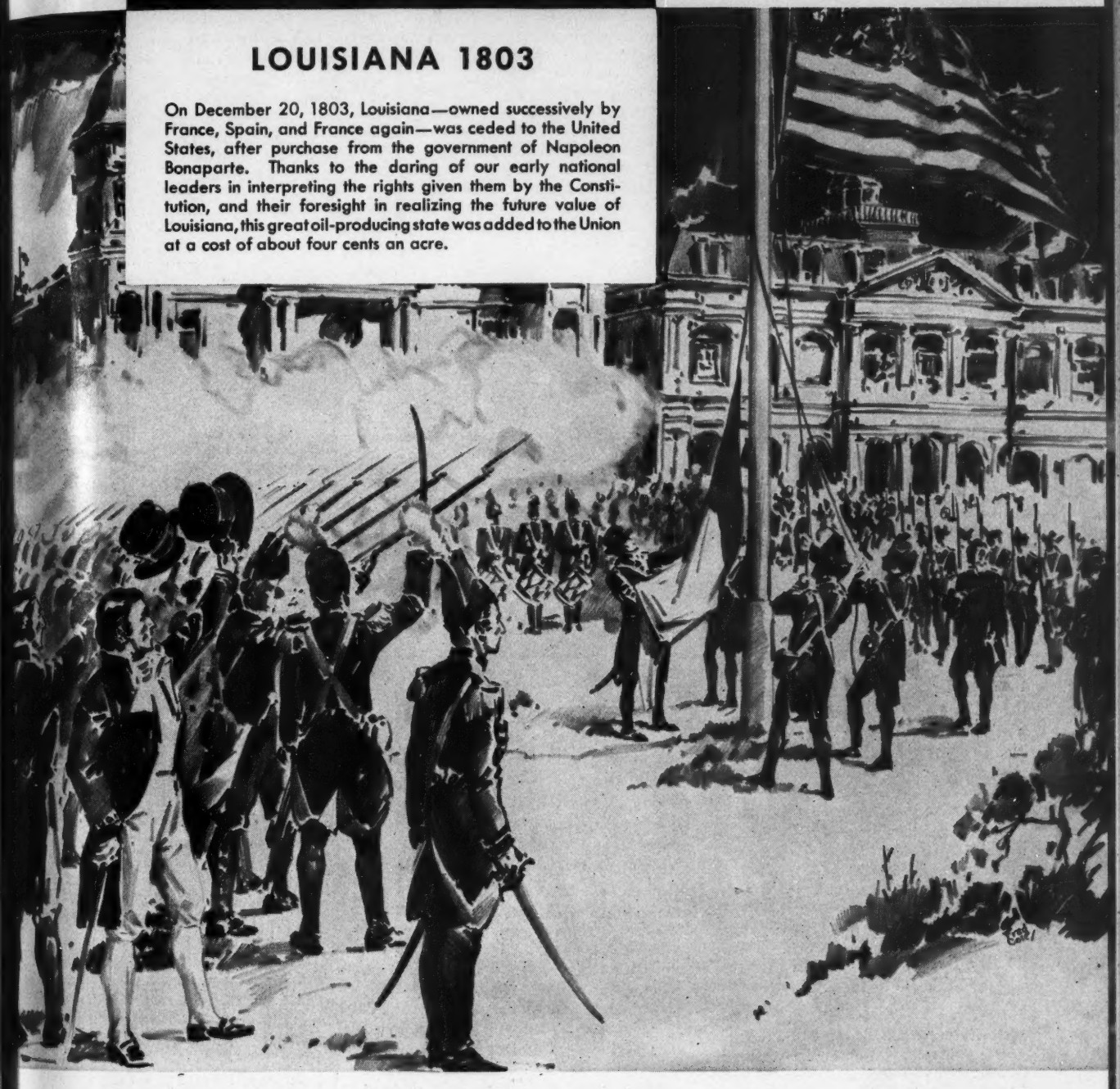
F. W. Kelso

Left: Southwest's drilling rig at left; servicing derrick at right. First well drilled in this group is that at the right over which rests the "rail road rig." After its completion, the big derrick was skidded to the west for each succeeding well, one more remaining to be drilled after finishing the one here shown drilling. Right: On the derrick floor of F. W. Kelso's Puente test.

# Great Pioneers

## LOUISIANA 1803

On December 20, 1803, Louisiana—owned successively by France, Spain, and France again—was ceded to the United States, after purchase from the government of Napoleon Bonaparte. Thanks to the daring of our early national leaders in interpreting the rights given them by the Constitution, and their foresight in realizing the future value of Louisiana, this great oil-producing state was added to the Union at a cost of about four cents an acre.



PIONEERS in any field are Leaders. They ve in the white light of fame, are copied nd envied. But—when a pioneer really leads", he continues to be a *leader*.

triving against what looked like insurmountble odds, Dowell Incorporated pioneered, nd in 1932 perfected Inhibited Acidizing. lew products and services vital to the il-producing industry have constantly been dded. They establish Dowell as the leader ell worthy of its enviable position.

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*Oil men who attend the Golden Gate International Exposition are cordially invited to visit the Dowell exhibit in The Dow Chemical Company booth.*

Look to

**DOWELL**

OIL AND GAS WELL CHEMICAL SERVICE

(Continued from Page 8)

jackets. In these systems, known as steam cooling, the entire jacket heat is removed through the latent heat of vaporization of the water in the jackets. Such systems fail in one vital point; that is the cooling liquid circulation is not sufficient to prevent the formation of steam or large steam bubbles and hot spots are formed. The temperature within the steam bubble may be considerably higher than that of the boiling point of water itself. To offset these various disadvantages our company has developed a system of cooling known as "Vapor-Phase" cooling. This system is simplicity itself, and consists essentially of a chamber known as a flash chamber into which the water from the jackets is circulated and from which chamber solid water is drawn and recirculated back to the jackets by means of a pump. This system is so arranged that the pump is under a constant head and circulates a normal amount of water. This circulation rate is based upon maintaining temperature differences not to exceed 20° which is approximately .4 of a gallon per minute per brake horsepower hour. The cooling liquid is circulated by the pump through the engine jackets and through the flash tank and returns to the pump with no appreciable cooling taking place except such unintentional cooling as may take place through radiation of the tank and lines. It is apparent, therefore, that the total body of liquid is rapidly increased in temperature until it reaches the boiling point of the liquid used. The vapor given off by the boiling liquid is then withdrawn from the flash chamber, passed through a condenser and the condensate returned by suitable means to the main body of liquid in the flash chamber.

The advantages of such a system are:

**1—Automatic temperature control.** The temperatures may be regulated by a choice of suitable liquids or mixtures of liquids from 160° F. to 340° F. or by providing suitable pressure within the jackets.

**2—Extreme simplicity.** Since the automatic control depends entirely upon the latent heat of vaporization of the liquid used (which in the case of water is 970 B.t.u. per lb.) it is absolutely stable and automatic.

**3—Efficient cooling** is accomplished because the entire jacket surface is maintained at or about the same mean temperature due to the fact that with the liquid at or about its boiling point ebullition is continually taking place thus insuring a rate of heat dissipation that can be accomplished only through the utilization of the latent heat of the liquid. For example, 1 lb. of water circulating through the engine with a temperature rise of 20° F. can only absorb 20 B.t.u., while 1 lb. of water at 212° F. evaporating to steam absorbs 970 B.t.u. or approximately 50 times as much.

**4—The system is completely sealed** and therefore, the only liquid loss is that due to mechanical leakage, which in practice is extremely small.

**5—Increased radiator capacity.** Since the radiator is used only for condensing steam, its capacity is greatly increased, for example:

| | Normal Cooling | "Vapor Phase" |
|---|---|---|
| Inlet Water | 140° F. | 212° F. |
| Outlet Water | | |
| Average Temperature | 2√ 300° F. / 150° F. | 2√ 424° F. / 212° F. |
| Air Temperature | 120° F. | 120° F. |
| MTD across Radiator | 30° F. | 92° F. |

From the above it is apparent that the radiator has triple the effective size. This means that the radiator can either be reduced in size, or the amount of air circulated decreased. In the latter case a very considerable fuel saving can be made as the average automotive type engine fan consumes from 7% to 50% of the total engine output.

### Practical Results

Our company had a 350 cu. in. natural gas engine equipped with thermostats operated at approximately 900 ft. piston speed and 65 lbs. B.M.E.P. installed with one of the local oil companies, and operating on natural gas containing about 3½ to 5% hydrogen sulphide. We found that the original oil had sludged sufficiently to shut the engine down during its first week of operation. The oil was then drained, refilled, and the customer proceeded to drain the oil every few days, as well as make several changes in the filter pack. At the end of 90 days when we inspected this engine, we found the cylinder liners worn approximately .080", all of the rings badly stuck, and a heavy deposit of extremely hard carbon over the entire surface of the head and top of the piston. The inside of the intake valve and valve chamber were also coated with a hard carbon deposit. This engine was partially reconditioned with new liners and rings, and the "Vapor-Phase" cooling system installed. Checks were made of its operation approximately every two weeks, and at the end of the first 30 days the filter pack was changed, but not the lubricating oil. At the end of 120 days the engine was shut down and a complete examination made. The liners did not show any wear that could be measured, the piston rings were free and loose, the top of the piston was coated with a red oxide coating, there being no trace of carbon either here or on the head or in the intake valve ports. Both intake and exhaust valves were likewise coated with a red deposit, and the cold compression taken on the engine was the same or slightly higher than when it was originally installed after the overhaul. The oil was sent to one of the major oil companies for analysis, copy of which is given here:

| | |
|---|---|
| Original Oil | 25 SAE |
| Test Oil—Used | 24.9 API gravity |
| Foundation COC ° F. | 415 |
| SU at 100° F. | 403 secs. |
| SU at 130° F. | 177.7 secs. |
| SU at 210° F. | 57 secs. |
| Neutralization Number | .20 |
| Water A.S.T.M. | 0 |
| Ash | .09 (red) |
| Insoluble in petroleum ether | 1.06% |
| Insoluble in chloroform | .82% |
| Sulphur | .17% |

Remarks: The tests on this used oil indicate that it is in very good condition. The amount of sludge as measured by the insolubles in petroleum ether and chloroform is, however, at the maximum that should be allowed. Therefore, a change of oil is recommended.

The "Vapor-Phase" unit on this system is of the air (radiator) condenser type. The discharge water is at 216° F. The water into the jackets is 210° F. The crankcase temperatures measured before the installation of the "Vapor-Phase" system were 165° with ambient temperature of 70°, and after the installation of the "Vapor-Phase" were 145° with an ambient of 72°.

At the present time we have installed some sixteen "Vapor-Phase" units. Fifteen of these have been of the radiator or air condenser type and one is of the water condenser type. They have been installed on engines from 350 cu. in. up to and including engines of 1000 cu. in. We have further operated an 8x10 2000 cu. in. engine at a discharge water temperature of 212° with inlet temperature of 198°, and while this latter engine was not on a "Vapor-Phase" system, it was possible to maintain these temperatures because of the elevated height of the cooling tower. These temperatures were maintained by manual operation of by-pass valves for sufficient period to indicate that there was no apparent difficulty in operation.

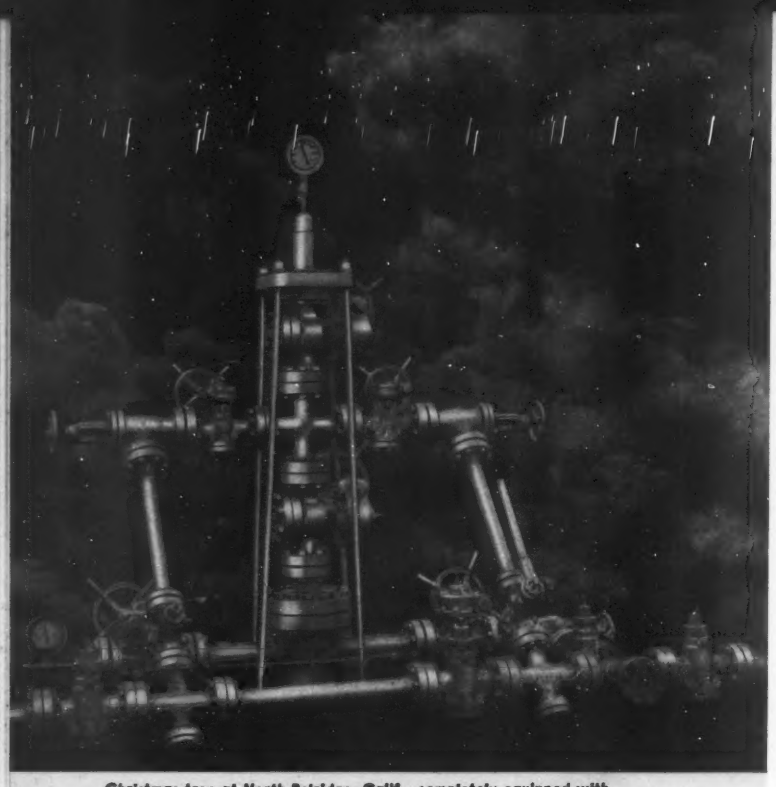
### Waste Heat Recovery with the "Vapor-Phase" System

The recovery of waste heat through exhaust boilers has been standard practices for a number of years. Since most applications of waste heat require that the temperatures at which it is used be relatively high, it has been impossible to use little, if any, of the jacket water heat. If exhaust boilers alone are used,

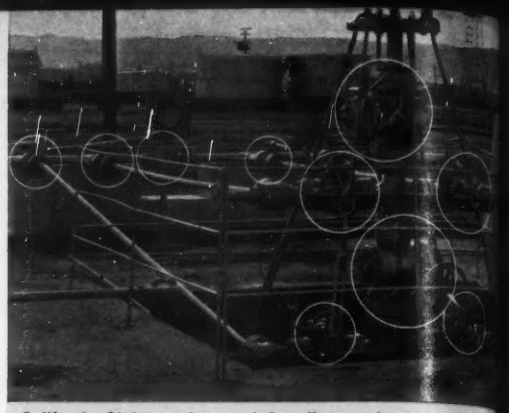
# . . . Not a Leak in an Ocean

Terminating in the briny Pacific, almost a half mile from the California shore, a 16″ pipe-line carries crude oil to deep water to load tankers. Drastic laws warn against contamination of the water. A tight shut-off was imperative. Corrosion had to be thwarted, too. Valves with exposed, threaded stems were inadequate. Only a Nordstrom Lubricated Valve could serve the need—and it has served for years. It provides an absolutely *blind* ending for the 12″ flexible hose which connects to the 16″ submerged oil line. Not a drop of oil can leak out; not a drop of salt water can intrude. The hydraulic seal of lubricant which completely envelops the plug ("Sealdport" patent) makes the Nordstrom Valve *impervious* to leaks—regardless of line contents—for oil, gas, air or chemicals. It's the *all-purpose* valve for *your* service.

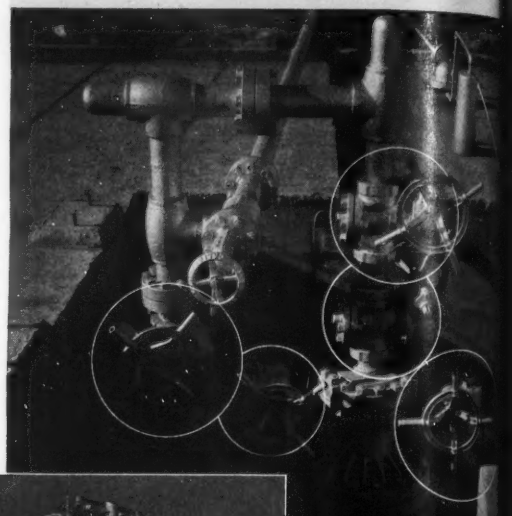
**NORDSTROM VALVES**



Christmas tree at North Belridge, Calif., completely equipped with Nordstrom Hypreseal Valves.



California Christmas tree and flow lines equipped with Nordstrom Hypreseal Valves.

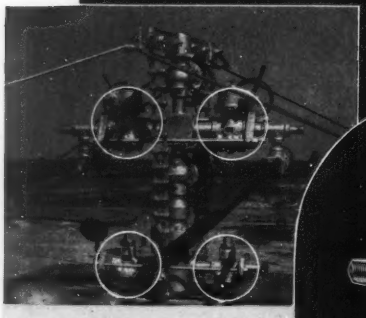


*More than ever*

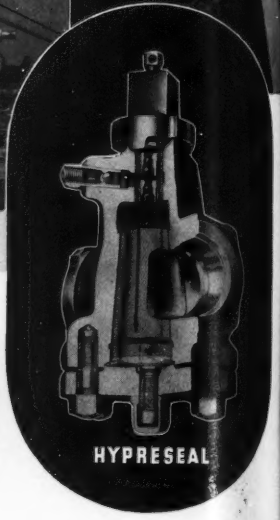
# NORDSTROM VALVES

## are the ONE and ONLY choice for California Christmas Trees

The most powerful Christmas trees in the World are California-installed. Nordstrom was first to introduce valves with 10,000-lb. test pressure for wells requiring this specification. The Nordstrom Hypreseal, with its impervious seal, is the ONE choice when every precaution must be taken against a disastrous blowout. Originally introduced with rectangular opening, the Hypreseal is now also available with round opening for drilling-through service and master control service where a continuous flush interior is desired.



They're Nordstrom Hypreseals.



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# NORDSTROM VALVES

WITH PATENTED "SEALDPORT" LUBRICATION

TABLE IV.

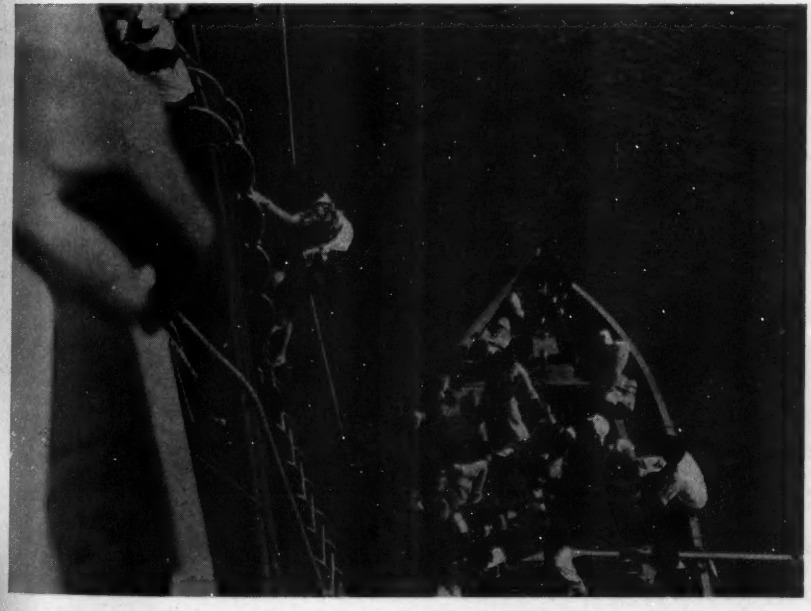
| Fuel | lbs. air per lb. fuel vapor | cu. ft. air per cu. ft. fuel vapor | B.t.u. per cu. ft. | PRODUCTS OF COMBUSTION # $CO_2$ per # $H_2O$ fuel # $N_2$Bal. | PRODUCTS OF COMBUSTION # $CO_2$ per cu. ft. $H_2O$ $N_2$Bal. | PRODUCTS OF COMBUSTION # $CO_2$ per 1000 B.t.u. $H_2O$ $N_2$Bal. | $H_2O$ in Gal. per cu. ft. fuel | $H_2O$ Gal. per 1000 B.t.u. | $H_2O$ Gal. per 11,000 B.t.u. =1 HP Hr. |
|---|---|---|---|---|---|---|---|---|---|
| Gasoline ..... | 15.07 | 59 | 5572 | 3.09 1.42 11.68 | .91 .42 3.4 | .162 .075 .62 | .05 | .009 | .099 |
| Natural Gas | 18.0 | 12 | 1100 | 3.14 1.29 11.42 | .225 .80 .83 | .205 .073 .76 | .096 | .088 | .96 |
| Sewer Gas.... (Methane) | 17.30 | 9.6 | 800 | 2.75 2.25 13.32 | .118 .094 .56 | .127 .104 .63 | .012 | .013 | .142 |

Note: Approx. 1 gal. per 10 B.H.P. Hours.

Volume @ 14.7# abs. and 68° F. (Streeter "Internal Combustion Engines")

the amount of heat available for practical application is between 2¼ to 2½ lbs. of steam per brake horsepower hour, and it is difficult to deliver this steam at over 5 lbs. pressure. By the use of the "Vapor-Phase" system, the discharge water from the jackets is circulated through a waste heat exhaust boiler and into the flash tank where the steam is removed, passed through the heat exchangers of the process, and the condensate returned to the flash tank. With this system it is possible to recover with relatively inexpensive equipment some 4 to 5½ lbs. of steam per brake horsepower hour at full load and to deliver it at 5 lbs. pressure. How much higher it is feasible to run this pressure is not known, but the writers do not believe that jacket water temperatures of as high as 350° will be injurious to the operation of engines. In fact, there are 12x15" diesel engines operating in Great Britain with a steam pressure of 125 lbs. which gives a jacket water temperature of 353° F., and it is common practice to operate liquid cooled aircraft engines at 325° F.

Plate No. 4 is a graphical representation of the heat distribution and available heat recovery possible with an explosion type engine. If it is possible to operate the jackets at a temperature sufficiently high so that the heat may be commercially utilized, it is possible to recover in useful heat energy approximately one-half of the total heat input of the fuel, and when this is added to the mechanical energy which represents approximately one-fourth of the total input heat, it gives an overall effective thermal efficiency of approximately 75%. Such total heat recovery will then place the internal combustion engine in the category of the most efficient heat utilization apparatus. The "Vapor-Phase" system makes such heat recovery commercially possible.



Captain Leland E. Hawkins, commanding the Tide Water Associated Oil Co. tanker S. S. Associated eight days out of Manila, on the morning of July 15 altered the course of his vessel and headed for the position which had been given by the Japanese ship Bokuyo Maru, which was on fire. In the early hours of the afternoon he brought the Associated over the horizon to sight four drifting lifeboats, heavily laden with the 209 survivors of the ill-fated Bokuyo Maru. All survivors were safely gathered aboard, sheltered, clothed and fed, with medical care given the injured.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●

*Delivered Before*
*California Natural Gasoline Association*
*August, 1939*
*Pacific Coast Club, Long Beach, Calif.*

●

## Standard Posts New Montebello Price Scale

The Standard Oil Co. of California announces an adjustment of prices which it posts for crude oil at the well in the Montebello field, Los Angeles County, effective 7:00 a.m., August 11.

Increases range from 1 cent per barrel for 26.0 26.9 gravity, to 8 cents for 40.0 40.9 gravity, in addition to which the price schedule has been extended to provide new prices for gravities of 41.0 and above. The new price schedule ranges from 77 cents per barrel for 14.0 14.9 gravity to $1.75 for 46.0 46.9 gravity and above.

This adjustment of prices is occasioned by a revaluation of crude oil due to quality and higher gravity of the new production in the field.

Effective Aug. 11, 1939, at 7:00 a.m. the following are the prices of Standard Oil Co. of California for its current purchases of crude oil at the well in the Montebello field:

| | |
|---|---|
| 14 to 21.9 Gravity..... | 77 cents |
| 22 G 79 cents | 34 G $1.26 |
| 23 G 82 cents | 35 G 1.30 |
| 24 G 85 cents | 36 G 1.34 |
| 25 G 89 cents | 37 G 1.38 |
| 26 G 93 cents | 38 G 1.42 |
| 27 G 97 cents | 39 G 1.47 |
| 28 G $1.01 | 40 G 1.51 |
| 29 G 1.06 | 41 G 1.55 |
| 30 G 1.10 | 42 G 1.59 |
| 31 G 1.14 | 43 G 1.63 |
| 32 G 1.18 | 44 G 1.67 |
| 33 G 1.22 | 45 G 1.71 |
| 46 G and above..... | 1.75 |

# LAUGH THIS OFF

It was pretty foggy down on Signal Hill the other night and the graveyard gauger was groping around helplessly when he bumped into the lease pumper. "Where the heck am I going?" he asked and the latter replied calmly, "Into the sump. I just came out of it."

---

And expostulated the indignant rousty, "Some day I'm gonna step right up and bust that foreman on the nose." "Oh no, you aint," replies his buddy, "You're gonna line up and take your turn with the rest of us."

---

Which brings us rather unexpectedly to **Phil Magruder's** favorite story: Away out in an isolated section of Oklahoma there was a string of stripper wells operated for a pipeline company by one old man. Thinking to make life a little more pleasant for its lone representative the company crated a bathtub and sent it out to him. After several weeks came a long letter of thanks from the old boy, ending "and I would of rit before this, but have been waiting for you to send the oars."

---

"I'll give you an order next time you come in," said **Roy Fry,** and the salesman walked around the block, came in and piped, "Well, this is the next time."

---

And **Bob Roberts** tells us of a generous Scotchman who walked into a crowded saloon slapped a quarter on the counter and shouted, "Well boys, what are we goin' to have—rain or snow?"

---

Then comes **Red Grace's** story about the salesman who was found dead in a northern hotel. In answer to a request for instructions regarding the situation the local manager received the following wire, "Send samples back by freight and search body for orders."

---

Recalling the rather verbose equipment salesman who once concluded a long exposition of the virtues of his product with "It's a good buy," to which **Doc Hudson** replied, "Well, so long."

---

On the subject of verbosity, **Rod Durkee** was recently playing a game of golf with one of these lads who talk their way around. Just as he was about to attempt a difficult bunker shot, the talkative one remarked sympathetically, "Isn't a trap an abomination?" "No," snapped Rod, "not if it's kept shut."

---

And says **Chris Rector** as he walked into the Cafe and found **Clare Gard** sitting before an immense steak, "My gosh, are you going to eat that alone?" "No, not alone," says Clare, "with potatoes."

---

Whereupon **Andy Hazard** rises to tell us about a Huntington Beach oil man who was cited as a co-respondent in a divorce case. "The thing is ridiculous," he shouted. "I never corresponded with a woman in my life."

---

**Nate Mull,** incidentally, defines a bachelor as a guy who never Mrs. anything.

---

Then imagine if you can the profound consternation of **Bill Roper** when he asked the hotel proprietor, "What are your terms for oil men?" and was told, "I never use them when ladies are present."

---

**Jack Carter** tells us about a gauger who just recently became the father of a brand new baby a few days later had his car repossessed by the finance company, which prompts Jack to remark, "Well, it won't be long till the baby is walking now."

---

And when the superintendent protested the accumulation of empty beer bottles in the dog house, the driller protested, "It wasn't me. I never bought an empty beer bottle in my life."

---

Reminding us of the petroleum engineer who couldn't find his glasses until his wife informed him they were just where he emptied them the night before.

---

With which remarks we stagger off the set. Remember the only lad who can lie down on the job with the approval of his boss is a sparring partner.

---

And he who dances must pay the fiddler—union wages.

BAKER

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Ask our Representative or your nearest Distributor to show you the authoritative Engineers' Report on NEW "RPM" DELO. This will give you the full results of our 10,000,000 miles and 90,000 hours of testing. By every test NEW "RPM" DELO assures clean-engine operation—free rings, clean pistons and cylinders, free oil passages, clean filters. Fact is, in a grueling test with NEW "RPM" DELO, engine filters remained free and unclogged after operating *6 times longer* than was possible with the highest quality straight mineral oil!

Yes, NEW "RPM" DELO spells *absolutely correct lubrication* for every type of Diesel engine, stationary or mobile, ashore or afloat. Cash in on all its service advantages yourself.

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Standard Oil Company (Nebraska)
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Standard Oil Company of Texas
Utah Oil Refining Company

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## STANDARD OIL COMPANY OF CALIFORNIA

# Field Development

## San Joaquin Valley

### Bandini Blows 30 Million While Testing Water Shut-Off

Blowing gas at a rate in excess of 30,000,000 cu. ft. and 51 gravity oil at the rate of 750 bbls. daily, Bandini Petroleum Co. recently made a successful test of water shut off over the high-powered Eocene sands in No. 48-18 in the Coalinga Northeast area.

A 7 inch water string was landed at 7975 ft., the water shut off test of which proved the quality of the zone. With the hole cleaned out to 5 ft. below the shoe and the tester packer set at 7948 ft., the tester was opened with a thousand foot water cushion. Open one hour and eight minutes, with a 3/8 in. bottom hole bean, the fluid rose to the surface in eight minutes accompanied by a strong blow of gas.

The strength of the gas flow can best be attested by the fact that its force rushed the recording pen completely off the chart of a thirty million foot orifice meter. Pressure at the well built up to 700 pounds while at the gas traps it varied from 200 to 400 pounds. Fluid consisted of 51.2 gravity lemon yellow condensate which was recovered from the traps at a 750 bbl. per day rate.

The operators expect to take only the bottom 20 ft. of oil sand when liner is run, in the hope that by blanking off the gas sands a more favorable gas-oil ratio may be established. Due to the tremendous thickening of the Turritella siltstone in the westerly portion of the area, almost all hope had been abandonded when the drill encountered the Gatchell oil sand at 7986 ft. Top of the formation carried grayish gas sand to 8025 ft. where the good oil sand was entered. The black oil sand was present to 8061 ft. where the drill encountered sandy shale with streaks of oil sand which carried to bottom at 8093 ft.

Near the easterly boundary of the same section, and near Amerada's production in sec. 17,19-16, Union Oil Co. has run 7 inch casing to 7940 ft. which is just over the pay sand topped at 7963 ft. Bottom of the hole is 8108 ft. in oil sand and much interest will be shown in the continued findings of the drill.

Amerada Petroleum Corp., field discoverer and operator of two producing wells, is drilling rapidly ahead on it's third project, S.P.L. No. 5-17. Located a quarter of a mile north of the discovery well, near the west quarter corner of section 17, it was last reported drilling below 4500 ft.

To the south of production, Standard Oil Co. drills No. 73-19B below 7600 ft. Located near the east quarter corner of sec. 19,19-16, the try is in the Kreyenhagen which was topped at 6835 ft.

A mile south, in sec. 30,19-16, Wilshire Annex Oil Co.'s No. 64-30B is below 5000 ft. in it's effort to find production between the Eocene Pool and Coalinga Northeast Areas.

---

### North Coalinga "Cat" Expires

Bottomed at 9613 ft. in barren Cretaceous shale, the Texas Co.'s Loeschner No. 1 sec. 12,17-16, has been abandoned. Located a little more than six miles northeast of the 10,711 ft. hole recently abandoned by the Shell Oil Co., the project found no encouragement in any of the zones encountered.

Deeper of the two surviving Cantua Creek Area wildcats is Superior Oil Co.'s S.P.L. No. 1 located in sec. 15,18-16, seven miles northwest of Amerada's production. The well was last reported in what is thought to be Eocene shale below 11,380 ft. This project is midway on a northwest axis between Shell's dry 10,711 ft. hole and a barren 12,336 ft. hole drilled during 1938 by the Pure Oil Co. in sec. 31,18-17.

Most northerly and last of the survivors is Richfield Oil Corp.'s Turk No. 1, sec. 4,17-15. The project is now bottomed at 7637 ft. in shale thought to be Temblor.

---

### Cole's Levee Outpost Makes Good Flow on Test

Richfield Oil Corp.'s Western 2nd SP B-14-3, most northerly of the Cole's Levee drillers is standing with 7 in. casing cemented at 9325 ft. Located near the west quarter corner of sec. 3,31-25, the well, which flowed at a 600 bbl. rate on formation test, adds considerable proved acreage to the field. Richfield is drilling it's second well, Western 1B-67-4, on sec. 4,31-25 and is now below 5300 ft.

Tide Water Associated Oil Co.'s KCL No. 81, sec. 14,31-25 is below 8500 ft. The company topped the oil sand in KCL No. 61, a quarter of a mile to the west, at 9932 ft.

Ohio Oil Co., discoverer of the field, recently completed its third well and has spudded the fourth. The new driller, KCL No. 45-11, is located in sec. 11, 31-25.

Standard Oil Co. is planning to drill three additional wells in sec. 9, where the company recently completed its so-called "gasoline well", KCL No. 20-1. The second well has been spudded and the other two are in process of rigging up.

Union Oil Co. has completed it's second well, Kernco No. 52-11, flowing at a 1080 barrel rate of 33 gravity clean oil through a 32/64 in bean. Approximately a half million feet of gas accompanied the controlled flow. Derrick is being moved in for Kernco No. 58-11 near the south quarter corner of sec. 11,31-25.

## Monterey County To Get New Test

Priest Valley Petroleum Co. is rigging up portable equipment for a test to be known as well No. 1. Located in sec. 20,20s-12e, the driller will be the first in this township.

## San Emigdio Test Cores Below 10,200 Ft.

Shell Oil Co.'s San Emigido area wildcat, KCL No. 2A-52-13 is getting into the deep hole class. Located in sec. 13,11-22 on the Maricopa cut-off, the well is now drilling below 10,200 ft. and to date has found nothing of interest. Nearest deep drilling to the present well was done by The Texas Co. in 1936. Situated a mile northwest of the Shell project, the Texas well, KCL No. 49 was carried to 10,014 ft. without fully penetrating the Etchegoin.

Continental Oil Co.'s project on KCL property near the Rancho San Emigdio is drilling below 7600 ft. in hard shale. Located in the mountains of sec. 5,10-21, the well, known as KCL No. F-1, has reported no showings. The Miocene formations were said to be barren.

### SAN JOAQUIN VALLEY WILDCATS

| Area | Well | No. | Section | Depth | Status |
|---|---|---|---|---|---|
| **Fresno County** | | | | | |
| Cantua Creek | Richfield Oil Corp., Turk | 1 | 4, 17-15 | 7702 | Drilling |
| | Superior Oil Co., S.P.L. | 1 | 15, 18-16 | 11442 | Drilling |
| | The Texas Co., Loeschner | 1 | 12, 17-16 | 9613 | Abandoned |
| Coalinga | Amerada Pet. Corp., SPL | 5-17 | 17, 19-16 | 4671 | Drilling |
| | Bandini Pet. Co. | 48-18 | 18, 19-16 | 8093 | Testing |
| | Parkford, E. A. & Assoc. | 45-24C | 24, 20-15 | 5978 | Drilling |
| | Rylatt, Harry E., Kipling | 3 | 26, 20-14 | 2010 | Prep. to resume |
| | Standard Oil Co. | 73-19B | 19, 19-16 | 7593 | Drilling |
| | Stuart Oil Co. | 1 | 12, 21-14 | 1410 | Idle |
| | Union Oil Co., Cook | 86-18 | 18, 19-16 | 7990 | Drilling |
| | Wilcox, John F. | 7 | 11, 20-14 | 25 | Drilling |
| | Wilshire-Annex Oil Co. | 64-30B | 30, 19-16 | 4577 | Drilling |
| Fresno Area | Seth Turner | 1 | 4, 14-19 | | Rig |
| Gatos Creek | Gatos Creek Oil Co. | 1 | 19, 19-13 | 294 | Idle |
| **Kern County** | | | | | |
| Antelope Valley | Par Petroleum Co. | 1 | 32, 25-17 | | Rigging up |
| Buena Vista | Gen. Pet. Corp., B.V.A. | 1 | 1, 32-24 | 8187 | Drilling |
| | Richfield Oil Corp., B.V.A. | 81-36 | 36, 31-25 | | Rig |
| | Shell Oil Co., B.V.A. | 45-9 | 9, 32-25 | | Grade |
| | Western Gulf Oil Co., K.C.L., Panhandle | 1 | 3, 32-26 | 10175 | Testing |
| Buttonwillow | Union Oil Co., Bowerbank | 4-23 | 23, 29-24 | | Rig |
| Devil's Den | Luxton, W. L. | 1 | 27, 25-18 | 710 | Idle |
| | Emigrant Hill Oil Co. | 1 | 24, 25-18 | 4271 | Idle |
| Edison | O'Rielly, Francis, Edison-Land | 2 | 5, 30-29 | 800 | Cleaning out |
| | Petrex, Inc., Metro | 2 | 6, 30-29 | 2700 | Cleaning out |
| Grapevine | Richfield Oil Corp. | KCL 1 | 28, 11-20 | 11004 | Coring |
| | The Petrol Corp., Reserve-Petrol | 33-5 | 33, 11-19 | 9190 | Idle |
| Greeley | General Pet. Corp., Sullivan | 1 | 12, 29-25 | 8620 | Drilling |
| | Standard Oil Co., KCL | 12-5 | 7, 29-26 | 7071 | Drilling |
| Midway | Baker, Leyse & Sonne | 1 | 20, 32-23 | | Rigging up |
| Mt. Poso | G. & V. Oils., Ltd. | 1 | 35, 26-28 | 634 | Drilling |
| Poso Creek | Hall-Baker Expl. Co. | 1 | 17, 27-27 | | Rigging up |
| Richfield Western | Richfield Oil Corp. | A-12-33 | 33, 30-25 | 8850 | Reaming |
| | Standard Oil Co. | KCL 21-1 | 19, 30-25 | 9977 | Drilling |
| Richgrove | Crusaders Pet. Corp., Quinn | 1 | 9, 25-27 | 1475 | Idle |
| | Dilamar Oil Corp., Quinn | 3 | 15, 25-27 | 2902 | Rig pump |
| San Emigdio | Bannow, Louis E., Irvin | 1 | 15, 10-23 | 1900 | Cleaning out |
| | Continental Oil Co. | KCL F-1 | 5, 10-21 | 7666 | Drilling |
| | French, Mabel E. | 1 | 14, 10-23 | 775 | Drilling |
| | Shell Oil Co. | KCL 2A 52-13 | 13, 11-22 | 10204 | Drilling |
| Strand | Continental Oil Co. | KCL D-2 | 14, 30-36 | 12524 | Drilling |
| Upper Kern River | Kern Valley Drilling Co. | 1 | 4, 29-29 | 1325 | Drilling |
| Wasco | Getty, George F., Janssen | 1 | 7, 27-24 | 13073 | Coring |
| **Kings County** | | | | | |
| Strattford | P. W. Burnham & Assoc., Bartells | 1 | 23, 20-20 | | Rig |
| Tulare Lake | Graphic Oil Co., Taylor | 1 | 34, 23-20 | 2468 | Drilling |
| **Tulare County** | | | | | |
| Terra Bella | Arnold, V. F., Yellow King | 1 | 9, 23-28 | 250 | Deepening |


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## New Company Drills Mt. Poso Wildcat

Assuming the Mount Poso wildcat venture in sec. 35,26-28 which was first reported as F. J. Hill and Associates, G and V Oils, Ltd. is drilling well No. 1 below 750 ft. The try is located two miles southeast of Dominion Pool Production. Behind the project are Goodrum and Vincent of Los Angeles.

## Strand Deep Test Is Drilling Ahead

Continental Oil Co.'s KCL No. D-2 sec. 14,30-26, is drilling in hard shale below 12,500 ft. Located four and a half miles east of Canal and two miles northeast of Ten Section, the well has encountered but slight encouragement. After finding the Stevens barren and digging through hundreds of feet of hard shale, slight stringers of oil sand were found in the interval 11,600 to 11,700 ft.

Tide Water Associated Oil Co.'s Strand-KCL No. E-24-7, second well in the company's discovery section 7,30-26, has encountered the oil sand at 8223 ft. With bottom in oil sand at 8330 ft. the hole is being prepared for casing.

Across the section line, in sec. 12,30-25, Shell Oil Co.'s Ohio-KCL No. 8-84-12 is drilling below 7100 ft. The Shell test is the first attempt at offset production to the Tide Water's recently discovered pool.

## Poso Creek Gets New Test

Hall-Baker Exploration Co. is moving in portable equipment for a test near the north quarter corner of sec. 17,27-27. Only previous drilling in the section was done in 1926 when Geo. F. Getty drilled a well near the center of the section to 2311 ft.

## Eocene Pool East Outpost Completed

Completed flowing at a 3198 bbl. rate through a 35/64 in. bean, the Superior Oil Co.'s Hight No. 2 became the Coalinga Eocene Pool's newest producer. Located in sec. 8, 20-16 at the extreme easterly limits of the proved area, the well produced clean oil of 28 gravity which was accompanied by nearly two million cubic feet of gas.

With nine strings drilling, the Eocene Area presents a busy picture of controlled field operations.

E. A. Parkford and Associates' Coalinga No. 45-24C is the only active outpost driller. Located near the center of sec. 24,20-15, a mile southwest of the Pool limits, the try is now drilling below 6350 ft.

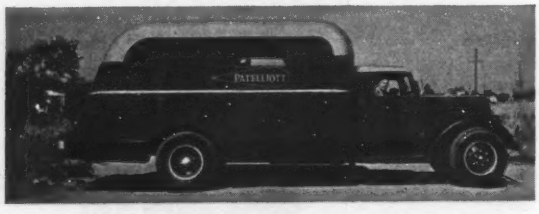
## Buttes Oilfields To Drill 6th "Gasser"

Buttes Oilfields, Inc., operating in Sutter County, has announced location for well No. 6. Located in sec. 1, 15n-1e, the try will be some 660 ft. east of No. 5 which was recently completed flowing 8,000,000 cu. ft. of gas daily.

## Coalinga Shallow Area Gets Outpost Driller

John F. Wilcox has spudded well No. 7 on sec. 11,20-14 at the westerly edge of West Coalinga production. Located as the latest addition to the slim activities in the shallow area, the well was last reported in the grass root stages.

Italo Petroleum Corp. Tenn No. 5 in section 1 of the same township, is bailing sand, mud and water, in a reconditioning job started late last month. Harry E. Rylatt's Kipling No. 3 is circulating oil to free stuck drill pipe. Located in sec. 26,20-14, the test is bottomed in sandy blue shale at 2010 ft. after finding the base of the Eocene near 1320 ft.

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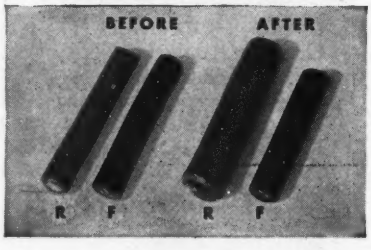
**FLAMENOL WIRE Resists OIL**




**Oil causes rubber to swell, does not affect Flamenol**

NOTE the size of the two samples of wire at the left—R, rubber; F, Flamenol. The two samples at the right were also of the same size before being submerged in oil for six months. Note how rubber has swelled. Flamenol has not changed.

You can easily make this test yourself. We'll gladly furnish samples.

Flamenol wire is approved by the Underwriters' Laboratories, Inc., for use in oily locations. Bulletin GEA-2733C gives latest details. For a copy—as well as for samples—address the nearest G-E sales office, or General Electric Company, Dept., 6—201, Schenectady, New York.

GENERAL ELECTRIC

## Antelope Valley Try Prepares to Spud-In

Antelope Valley's scheduled test, which was reported as P. D. Snavely No. 1, is preparing to spud. Located 10 miles west of the small Devils Den field, in sec. 32,25-17, the try will be known as Par Petroleum Co.'s No. 1 well. The hole will be the first drilled within a radius of several miles.

## Getty Cores For A-2 Sand

After a long drilling job Geo. F. Getty's Janssen No. 1 is at last approaching the depth at which the A-2 sand may be expected provided it is present at this outpost location. Situated in sec. 7,27-24, a half mile west of Wasco production, the project was last reported below 13,000 ft. coring for the oil sand.

## Tulare Lake "Cat" Drilling Near 3000 Ft.

Graphic Oil Corp.'s Taylor No. 1, located in a large undrilled tract southeast of the Dudley Ridge Gas Area, was last reported nearing the 3000 ft. level after setting surface pipe at 300 ft. The site is some eight miles east of the three producing wells in the so-called Kettleman Middle Dome oil field.

## Petrol Corp. Idle After Losing Fish

The Petrol Corp.'s Reserve-Petrol No. 33-5, located in sec. 33,11-19 on the plains at the base of the Ridge Route, is standing idle. The well had just started making new hole after sidetracking a string of lost drill pipe through 1000 ft. of basalt. Bottom is now 9190 ft. with the top of the fish at 5480.

## Standard and Gen. Pet. Drill Greeley Outposts

General Petroleum Corp.'s Sullivan No. 1, located a little more than a mile northwest of the Greely Field in sec. 12, 29-25, is drilling in hard shale below 8620 ft. The project passed through the Greeley sands without coring but placed it at approximately 8200 ft. by the drillers log. A great amount of acreage would be thrown open to the drill by a strike at this point, since the Rio Bravo is present and producing in both the Greeley and Rio Bravo Fields.

Drilling between the Sullivan well and the Greeley proved area, Standard Oil Co.'s KCL No. 12-5, which has recently resumed work, is making hole below 6966 ft.

## Richfield to Core Ahead On Wheeler Ridge KCL No. 1

Apparently accepting the fact that the oil sands so patiently tested are wet, the Richfield Oil Corp. is planning to core KCL. No. 1 ahead for a look at the lower Oligocene and possibly the Eocene formations. The well, located in sec. 28,11-20, atop Wheeler Ridge at the south end of the San Joaquin Valley, was completed originally from the Miocene formation in January of this year. Initial flow was at an 1800 bbl. rate of 38 gravity oil cutting 20% water. After a few hours the flow decreased and water increased to a point where it was deemed expedient to pump. Water came in fast and recovery diminished to a point where in March the well was making only 89 barrels daily of which nearly 40% was water.

In the hope of finding deeper production, the hole was prepared for deepening and in April drilling was resumed.

At 10,718 ft. the well excited great comment by finding oil sands of ap-

(Continued on Page 28)


JERGUSON

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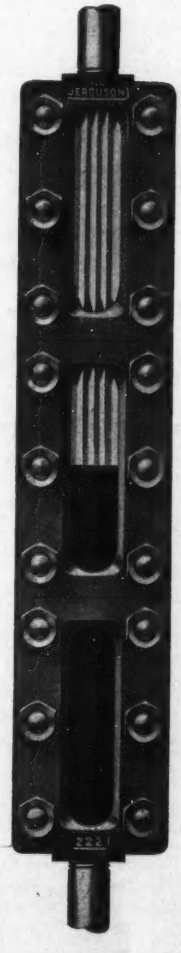

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# Los Angeles Basin

## Wilmington Development Maintains High Rate

Despite its lack of fan-fare, the Wilmington field still remains the most important in the State of California with its twenty-odd drilling wells and its daily yield of 85,000 bbls. Indicating that its position is likely to be maintained indefinitely is the fact that nowhere within the huge proved area is there anything resembling a boom, the development work all being of a routine nature. Although absolute limits have not been established in several directions, engineers estimate that the eventual oil recovery of this remarkable field will be in excess of 800,000,000 bbls., a figure which increases in significance when compared with the 18 year record for Signal Hill of 620,000,000 bbls. and Kettleman Hill's 11 year total of 201,000,000 bbls. Another sign of continued activity may be seen in the number of new projects preparing to drill, there being at least one for every string of tools actually going 'round and 'round.

Among the most interesting of wells lately placed on production are three on Terminal Island, two on the "W" parcel for the City of Long Beach and one by Brookline Oil Co. on Los Angeles city property. The "W" wells produce from both Terminal zones while the Brookline utilizes only the upper Terminal. All are credited with large potentials.

In the old Wilmington townlot area, several wells have been deepened to the Ford zones obtaining modest yields of 30 gravity oil. In the outlying sectors are several redrill jobs caused by liner failure due to sand cutting. In most cases the trouble is being remedied by installing some form of gravel pack.

Scheduled for an early start is the long awaited development of the county flood control channel which forms the barrier to eastward extension in the Long Beach harbor. Continental Corp. expects to obtain final clearance at any time for the first of at least a dozen wells.

## Probable Limits Seen At West Montebello

Developments during the last two weeks tend to indicate that good production in the West Montebello field probably will not extend much beyond the 7300 ft. sub-sea contour at the top of the Eighth zone. Basis for this belief is found in the two wells of Fullerton Oil Co. which found the lower portion of the zone wet.

Fullerton-Trustee No. 1, located at the southeast corner of Poplar and Lincoln Streets, topped the Eighth zone at 7510 ft. which, corrected for an elevation of 226 ft., places the sea-level top at 7284 ft. A formation test from 7605 to 7660 ft. indicated the lower portion of the zone wet, which again corrected for sea-level, shows water below minus 7380 ft. Indicating the same condition holds to the west, Fullerton's Scott-Arnold No. 1, located north of Lincoln and west of Poplar, plugged bottom from 7657 to 7625 ft. which corrects to 7385 ft. If the bottom water is flat on the 7380 ft. contour, it is apparent that farther extension in the easterly portion of the area is nearly out of the question.

If, however, conditions turn out to be as sketched on the map on pages 10 and 11 of this issue, much area remains to be developed in the southerly and westerly sections. Although continued drilling may prove the field to be as large as an arbitrary continuing of the contours would indicate, it would, at the present time, be assuming far too much. The only logical assumption is that Eighth zone easterly limits may very nearly be considered established.

With the pegging of present limits, many operators are turning over in their minds the possibilities of yet deeper horizons. Substantiating their hopes is the deep Standard Baldwin No. 82 which drilled to 9334 ft. north of the current development. All the deep productive zones were encountered in this hole but were barren due to its low position on the structure. Alternate shale and sand bodies were cored all the way to bottom which in a better location may be productive.

Very good production was obtained by Fullerton Oil Co. in both of its wells, the Trustee flowing initially at a 1200 bbl. per day rate. Beaned back to 32/64 in., the yield was 660 bbls. of 32 gravity clean oil and 500,000 cu. ft. of gas. The low gravity and favorable gas-oil ratio are unquestionably due to the low structural position of the well.

Greatest activity in the field is now along both sides of Beverly Blvd. from the intersection of 6th St. westward to Wilcox Ave. where The Texas Co. is drilling the westerly outpost, Wilcox No. 1. Completions have been uniformly large and all wells so far have been clean, or nearly so, in the Eighth zone. The field has the distinction of being without a dry hole.

### LOS ANGELES BASIN WILDCATS

| Area | Well | No. | Section | Depth | Status |
|---|---|---|---|---|---|
| Castaic | Lang, Ed. W., Rupy | 1 | 7, 5-16 | 510 | Idle |
| Dominguez | California Western Oil Co. | 1 | 32, 3-13 | | Location |
| Gardena | Citizens Oil Co., Duna | 1 | 30, 3-13 | | Grade |
| Inglewood | Vanguard Oil Co., L.A.I. | 1 | 29, 2-14 | | Rig |
| Mint Canyon | Redwood Oil Co., Mitchell | 2 | 22, 4-15 | 130 | Fishing |
| Montebello, West | Ridge Oil Co., Sea Cliff | 1 | 3, 2-12 | 8039 | Idle |
| Newhall | Mangrum and Page, Lintz | 1 | 4, 3-15 | 352 | Idle |
| Palos Verdes | Rolling Hills Pet. | 1 | 27, 4-14 | 5985 | Drilling |
| Playa del Rey | The Texas Co., Inglewood Est. Co. | 1 | 34, 2-15 | 6672 | May abandon |
| | Vulcan Oil Co., Del Rey | 1 | 22, 2-15 | 700 | Drilling |
| Puente | Stabeck & Assoc. | 1 | 14, 2-10 | | Rig |
| San Pedro | Sepulveda Oil Co. | 1 | 23, 5-14 | 1100 | Idle |
| Sunland | Casa Grande Oil Co., Lopez-Lundy | 1 | 1, 2-15 | 1050 | Idle |
| Towsley Canyon | J. E. O'Donnell | 1 | 8, 3-16 | 5225 | Idle |
| Whittier | C. W. Partridge, Hillside | 1 | 22, 2-11 | 1780 | Idle |
| | Taylor Drlg. & Prod. Co., Gregg | 1 | 17, 2-11 | 6058 | Idle |
| | **San Bernardino** | | | | |
| Carbon Canyon | Carbon Canyon Oil Co. | 1 | 30, 2-8 | 256 | Prep. to resume |
| | John Hokom Oil & Gas Co., Ltd. | 1 | 31, 2-8 | 2941 | Plugging—may abandon |

### NORTHERN COUNTIES WILDCATS

| County | Well | No. | Section | Depth | Status |
|---|---|---|---|---|---|
| Colusa | Empire Oil & Gas Corp., Dunlap | 1 | 36, 16-5 | | Location |
| Humboldt | The Texas Co., Eureka | 3 | 21, 3-1 | 3900 | Drilling |
| Monterey | Priest Valley Pet. Co. | 1 | 20, 20-12 | | Rigging up portable |
| San Benito | Silver Creek Oil Co. | 1 | 11, 17-11 | 160 | Idle |
| San Joaquin | Utilities Pet. Co. | 1 | 7, 1-6 | | Rigging up |
| Sutter | Buttes Oilfields, Inc. | 6 | 1, 15-1 | | Grade |
| Yolo | Standard Oil Co., Corcoran | 1 | 29, 9-1 | | Location |

## New Companies Plan Interesting Wells

Several concerns have recently been formed which plan work of more than usual interest.

Kayak Oil Co., headed by Loren R. Gans, was incorporated for the purpose of drilling an exploratory well in Apple Valley, San Bernardino county. A new test of the Conejo area of Ventura county is planned by the newly organized Sulphur Springs Oil Co. With the intention of drilling an outpost well in the East Coyote area, L. R. Meyers, K. A. Wright and C. A. Windham have incorporated the Anaheim Petroleum Co. Mojave Petroleum Co. and Sillick Oil Co. will both operate in the Huntington Beach field.

A new well in the old Richfield field is the objective of Maplehurst Oil Co., according to J. H. Fawcett of Long Beach.

## El Hondo Drills Deep Hill Test

With the intended 10,000 ft. well of Dormax Oil Co. below 4600 ft., attention of Signal Hill oil operators is divided between that project and El Hondo Petroleum Co.'s well near the intersection of Spring St. and American Ave. Taking over the old 7300 ft. Venaga hole, the new concern is redrilling to deepen to approximately 8000 ft. where it is believed a commercial yield may be obtained. Some difficulty is being experienced in getting out of the old casing at 6000 ft.

**Copies of the newly revised West Montebello map, shown on pages 10 and 11, are available at 828 Petroleum Securities Building, Los Angeles.**

**Printed on a 1 in = 600 ft. scale, the map is corrected to date for well status, property ownership, and recorded leases. A valuable feature of the map is the 8th zone contours, shown on control points and corrected to sea level.**

**Single copies of the map are priced at $1.00. Three copies $2.00. Six copies $3.00.**

## Rosecrans Outpost Drills Below 7000 Ft.

Making rapid progress in their joint Rosecrans outpost are Barnsdall Oil Co. and Wilshire Oil Co. Located on San Pedro St. south of Redondo Blvd. and east of the two small Averill producers, the drill was last reported at 7000 ft. with coring scheduled for the next 200 ft. The well, known as Darling Community No. 1, is rumored to be slightly higher than its westerly neighbors.

Moving one location south, the Averill interests spudded their third well which is now drilling near the 4500 ft. level. The first two projects flow clean oil at the rate of 100 to 125 bbls. a day from respective depths of 7644 ft. and 7837 ft.

Southern California Petroleum Corp.'s Slabaugh No. 1, located north of Compton, is about through with a bad fishing job which delayed progress with bottom at 6860 ft.

## Rolling Hills Well Works Only Day Tours

Working only a daylight tour, Rolling Hills Petroleum Co. is reported to be in Nodular shale at 6000 ft. The project, which has been drilling intermittently for the past two years, encountered the first nodules at the 5600 ft. level.

## New Well Spuds At H. B. 5-Points

Newest well to try for the elusive Five Points production at Huntington


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# AT VENTURA

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And it was that same year — 1932 — that Bowen established in Ventura the fifth of its *six service stores* covering *all* the active fields in California. During the past seven years, Bowen's Ventura Service Branch has furnished complete fishing tool service to operators in Santa Paula, Santa Maria, Ventura, Orcutt, Cat Canyon, Piru, Fillmore and other fields in that area.

Johnnie Dale, formerly of the Long Beach branch, is Store Manager at Ventura, with Ed "Stonewall" Jackson and Harold Riley working out of Ventura as Bowen Service Men. As in every other active field in California, Bowen Tools and Bowen Service Men at Ventura are ready on a moment's notice to give operators the fastest, most dependable and most economical fishing tool service on any well, day or night.

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Beach is that of Island View Oil Co. Located immediately south of J.E.F. Oil Co.'s Bruce No. 1, the well can hardly fail to find the oil sand.

Neither of the two cleanout projects on the flat east of the city has made sufficient progress to be interesting, both having failed to reach their old bottoms.

On the ocean front, Southwest Exploration Co. placed its No. 17 on the pump for 435 bbls. from a depth of 5440 ft.

## California Western To Extend Dominguez

Hoping to extend the Dominguez field across Avalon to the northwest, California Western Oil Co. is planning to start work immediately on a semi-wildcat well. Recent success of Union Oil Co. in obtaining good wells on the westerly portion of the Callender lease has encouraged the drilling of the new outpost. California Western acquired the leases about a year ago.

## Bristol Enters Torrance Extension

Newest company to enter the southeast extension area of the Torrance field is Bristol Oil Co. of Los Angeles. Derrick has been erected by the recently organized concern on the Spring lease in the Figueroa St. section of the field.

J. E. (Jim) O'Donnell, veteran individual operator, is drilling his No. 73 below 5000 ft. in the southerly part of the extension. The well is Mr. O'Donnell's second for the area.

Within the old part of the field activity is at a standstill, nothing having been started since Standard Oil's recompletion of Marble No. 1-10 as an 85 bbl. flowing well.

## Carbon Canyon Well Pumps Only Water

After recovering only water on a prolonged pumping test, John Hokom Oil & Gasoline Co. is said to be considering abandonment of its Carbon Canyon wildcat well. Located in sec. 31,2-8, the well was drilled to 2941 ft. from which point it was plugged to 1375 ft.

In sec. 30, Carbon Canyon Oil Co. is reported to be rigging up to resume drilling its Schuh No. 1 which was technically spudded several months ago.

## Del Rey Wildcat Finds Schist Barren

The Texas Co. is preparing to abandon its del Rey wildcat, Inglewood Extension No. 1, after a formation test indicated the basement schist barren at this point.

Drilled to 6672 ft. in but little over three weeks, the hole entered the schist at approximately 6650 ft., apparently too low to find an accumulation of oil. The well is located in 34,2-15, south of the Playa del Rey field.

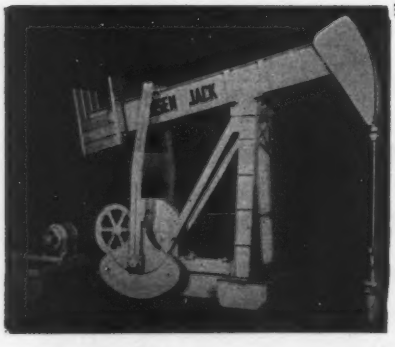
In the area where Sharby Oil Co. drilled two years ago, Vulcan Oil Co. has spudded a new exploratory well. The location is near the intersection of Lincoln and Culver Blvds.

## Whittier Deep Test Fails To Find Oil

No. 19, Colorado Oil Co.'s deep test of the old Whittier field failed to find production to its total depth of 5417 ft. and has been plugged back to the old shallow zone. The well is the second attempt of the company to find new sands in the old field which was discovered in 1912.

## E. Torrance Test Suspends Drilling

Apparently having found nothing warranted a production test, Bren Oil Co. suspended drilling in its easterly Torrance outpost located on Main St. south of Sepulveda Blvd. Total depth of the hole is approximately 5400 ft.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# Coastal District

## Ventura Activity Maintains Level

Maintaining its high development rate, Ventura Avenue now has more than twenty strings of tools actually working, making it one of the most active areas in the entire state. As always, conservatism is the theme of all operators in the field, the only project showing any daring being that of California Alliance Petroleum Corp. which is a northwesterly offset to Tide Water Associated's productive Hartman lease. As the location is not as low structurally as some good producers to the east, engineers maintain that only a miracle can prevent a good completion.

British American Oil Producing Co. is preparing to drill Hartman No. 8 into the oil sand after cementing 7⅝ in. casing at 7920 ft. The well is located on the Bolsa Chica lease and is the company's second venture in this field. In the same section of the field, near the Avenue, General Petroleum Corp. is drilling Barnard No. 16 at 6900 ft.

On the large property in the northeast portion of the field, Lloyd Corp. is drilling wells Nos. 3 and 4 at 6700 ft. and 5200 ft. respectively. Well No. 2 surprised the oil fraternity two months ago by blowing in while circulating oil to loosen stuck drill pipe.

Tide Water Associated Oil Co. and Shell Oil Co., as usual, are the most extensive operators, having the bulk of the active strings of tools between them.

## Gato Ridge Well Cores at 3200 Ft.

Magenheimer No. 5-21, Petrol's lone drilling project in the Gato Ridge field, is coring brown shale and chert at 3200 ft. Dips as high as 70 degrees are said to have been encountered in the last few feet of hole. The well is being drilled from the surface location of No. 5-11 and is being whipstocked to its proper subsurface position.

## K. C. Oil Spuds Tapo Wildcat

K. C. Oil Co., a newly formed concern, has recently spudded in its wildcat well on the Marr property in sec. 32,3-17; two miles east of the old Tapo Canyon field. Long considered to have productive possibilities, the Marr lease has been tested by several operators including the Shell Oil Co., which drilled to 3922 ft. ten years ago.

## Drilling at Standstill In Old Summerland Field

Now in the midst of one of its slack periods, the old Summerland field is entirely devoid of drilling activity.

Discovered in the year 1894, the field developed slowly, reaching its peak in 1899 when its total yield was slightly over 208,000 bbls. From that high point, production gradually declined until 30 years later in 1929 when a small drilling boom more than doubled the annual production from 45,000 bbls. in 1928 to 94,000 bbls. The following year, 1930, a new high was reached at 118,000 bbls. but this figure was halved in 1931, production continuing to drop until last year's total was only 11,700 bbls. At the present time a half dozen wells produce about 30 bbls. a day between them.

With a 45 year total of only 3,150,000 bbls., Summerland as an oil field is practically insignificant, its neighbor, Ventura Avenue, producing that amount in about three months under curtailment. However, world fame was achieved as a submarine oil field, and tourists traveled miles to see oil derricks on piers out in the ocean. Because production dwindled to almost nothing, the piers have been washed away by high seas or are in a bad state of repair and the field is now only reminiscent of its heyday.

Although many tests have been drilled to the Sespe, only the Fernando has been found to be commercially productive but many geologists believe that a trap may yet be found in the lower strata which will return Summerland to the status of a real oil field.

## Sun-Bell Attempts Lompoc Extension

Attempting to extend the old Lompoc producing area to the northwest Sun-Bell Drilling Co. of Los Angeles is drilling its first well near the southeast corner of sec. 29,8-34 on property of the Alphonso E. Bell Corp. Considered to have an excellent chance of obtaining commercial production, the well is one of the most interesting in the entire Coastal area. When last reported bottom of the hole was near the 1000 ft. level.

**COASTAL COUNTIES WILDCATS**

| Area | Well | No. | Section | Depth | Status |
|---|---|---|---|---|---|
| **Santa Barbara County** | | | | | |
| Bicknell Area | Hogan Pet. Co., Zabala | 1 | 33, 9-34 | 4010 | Reaming |
| Capitan | Litho Oil Co., Rhode I. | 1 | 4, 4-30 | 3015 | Idle |
| Carpinteria | Carpinteria Oil Co. | 1 | 32, 4-25 | 2458 | Idle |
| Carreaga | Barbara Pacific Oil Co. | A-A 2 | 8, 8-33 | 6820 | Idle |
| Foxen Canyon | Richfield Oil Corp., Tinaquaic | 1 | 36, 9-32 | 5541 | Idle |
| Gato Ridge | The Petrol Corp., Magenheimer | S-21 | 2, 8-32 | 3190 | Drilling |
| Orcutt | O. C. Field Gas. Corp. | 1 | 21, 9-33 | 7382 | Abandoned |
| | So. Calif. Drlg. Co., Houck | 1 | 9, 9-33 | 5002 | Idle |
| Lompoc | Sun-Bell Drilling Co. | 1 | 28, 8-34 | 725 | Drilling |
| Los Olivos | United Western Oil Co. | 1 | 15, 7-30 | 3935 | Cleaning out |
| San Marcos | Richfield Oil Corp., San Marcos | 1 | 20, 6-29 | 1961 | Idle |
| | Richfield Oil Corp., San Marcos | 2 | 20, 6-29 | 3600 | Abandoned |
| | Richfield Oil Corp., San Marcos | 3 | 20, 6-29 | | Rigging up |
| Summerland | Glenray Oil Co., Glenray | 1 | 1, 4-26 | 90 | Idle |
| | Oil Group, Inc., Hyland | 1 | 16, 4-26 | 1315 | Idle |
| | Topeka Oil Co. | 17-1 | 22, 4-26 | 1770 | Idle |
| **San Luis Obispo County** | | | | | |
| Elk Horn | Calif. Pet. Prod., Irons | 1 | 19, 10-24 | 2410 | Drilling |
| | Newton, S. M., Stafford | 1 | 18, 31-21 | 3888 | Drilling |
| | Newton, S. M., Well | 1 | 3, 32-21 | | Grade |
| | Temblor Oil Co. | 1 | 22, 31-21 | 3465 | Idle |
| Paso Robles | Epco, Inc. | 1 | 27, 26-13 | 5660 | Cleaning out |
| **Ventura County** | | | | | |
| Ojai | Coronet Oil Co., Coronet | 1 | 17, 4-21 | 2298 | Drilling |
| Red Mountain | Martin, J. W. | 3 | 15, 4-21 | 1900 | Idle |
| Sespe | Nevada-Fortuna Oil Co. | 1 | 13, 4-19 | | Rig |
| | Renard Oil Co. | 1 | 6, 4-19 | 175 | Drilling |
| | Speik Oil Co. | 1 | 33, 5-19 | 3960 | Bailing |
| Shiells Canyon | Galveston Oil Co. | 1 | 5, 3-19 | 3140 | Washing perfs. |
| | Shomy Oil Co., Shomy | 1 | 32, 4-19 | 825 | Idle |
| Simi | Levesque, G. M. | 1 | 17, 2-18 | 2210 | Idle |
| Tar Creek | Section 20 Oil Co. | 1 | 20, 5-19 | 3803 | Drilling |
| Santa Susana | K.C. Oil Co., Marr | 1 | 32, 3-17 | 110 | Drilling |

## New Wells Are Projected For Santa Maria Valley

With Fred Cole's No. 19 nearing completion at 5300 ft., Santa Maria Valley activity is on the increase due to the announcements of new wells by Fred Cole and W. R. Gerard. The Cole project will be on lot 11 of the Paderewski Subdivision adjoining No. 19 and will be known as Well No. 20.

A Gerard well is to be drilled near the west quarter corner of the northwest quarter of sec. 27,10-34 and will be called Berneiser No. 2.

## Richfield Abandons San Marcos 2, Starts 3

Immediately after abandoning San Marcos No. 2, Richfield Oil Corp. began preparations to skid the rig to a previously selected location for No. 3. Although the company admits nothing more than negligible showings in the first two wells, rumors persist that indications are quite above wildcat averages. However no production tests were made in the No. 1, suspended at 1961 ft. or the No. 2, abandoned at 3600 ft. All three wells are grouped in 20,6-29 on the old Rancho Tequepis, eight miles due north over the hills from Elwood.

Several independent companies hold acreage in the vicinity but are awaiting results of Richfield's campaign before starting test wells of their own.

## Speik Oil Tests Chappuis No. 1

Speik Oil Co. is conducting a pumping test of its Sespe area wildcat, Chappius No. 1, located in sec. 33,5-19. New hole has been made to 3961 ft. and with casing at 3660 ft. the well is being alternately pumped and cleaned out because of excessive sand trouble. Considerable oil is recovered while on the beam.

In the Tar Creek sector, Section 20 Oil Co. is drilling in gray sand showing light cuts at 3800 ft. The formation is said to be Eocene.

## Zabala Well Recovers Fish

After a two weeks' fishing job Hogan Petroleum Co.'s Zabala No. 1 is again coring ahead. With bottom at 4010 ft., the drill pipe stuck at 1000 ft. due to pinching hole. Zabala No. 1 is a test for Monterey production and is located south of the old Santa Maria field in projected sec. 33,9-34.

## Epco Deepening Paso Robles Test

Epco, Inc., has resumed operations on its wildcat well in sec. 27,26-13 eight miles east of Paso Robles on the road to Shandon. Drilling was suspended at 5660 ft. in Temblor formations during June of this year. It is planned to continue drilling until either the hole is lost or oil is discovered.

## Coronet Tests Ojai Outpost

An interesting test is being made by Coronet Oil Co. of the old producing area in sec. 17,4-21 five miles east of Ojai. Hole is bottomed at 2300 ft. and 6⅝ in. casing including 290 ft. perforated was landed. When last reported, the well was being swabbed with the fluid showing considerable oil and gas.

(Continued from Page 23)

parently commercial possibilities in the San Emigdio section of the Oligocene. The sands carried in varying thickness and quality to bottom at 11,004 ft. A series of production tests followed the landing of casing at 10,815 ft., all of which were wet, and the latest of which, with hole cleaned out to 10,875 ft., flowed salt water at a 625 barrel rate.

## Buena Vista Lake Activity Continues

Most significant of the tests in this area is Western Gulf Oil Co.'s KCL-Panhandle No. 1. Located a mile and a half southeast of the Buena Vista Lake Gas Field, and three miles east of the lake bed, in sec. 3,32-26, the project is testing water shut off on the 7⅝ casing. Bottomed in silty oil sand at 10,175 ft. after finding the top of an oil sand considered to be the equivalent of the Stevens at 10,013 ft. the well was tested from 10,009 ft. to 10,121 ft. With a 1500 ft. water cushion, and with the tester open 36 minutes, the well blew gas at an estimated 5,000,000 foot rate. A strong gasoline odor was reported from the gassy mud recovered in the pipe. Encouragement resulting from the test prompted the deepening to present bottom. Oil bearing formations are said to continue to present depth.

At the northerly tip of the gas field Richfield Oil Corp. has erected rig for BVA No. 81-36. Located in sec. 36,31-25, on the bed of Buena Vista Lake, it was necessary to do considerable filling and pile driving to afford a suitable foundation for the well. The rather expensive project will be the latest of the few wells drilled in the lake bed.

Shell Oil Co. is filling in a drill site for a test of the Buena Vista Lake bed in sec. 9,32-25. Located at the south edge of the lake, the well will be known as B.V.A. No. 45-9, and will be Shell's second test of the section. Shell's B.V.A. No. 1, at the west edge of the section was drilled to 9453 ft. in 1935, and obviously did not satisfy the operator's curiosity concerning the possibilities of oil production at this point.

General Petroleum Corp.'s BVA No. 1, located in sec. 1,32-24, between the Buena Vista hills and the lake, was last reported as spot coring in shale at 8185 ft.

## Announce Improvement In American Release Valve

The American Iron and Machine Works Co., of Oklahoma City and Houston, announces an improvement in the American Release Valve.

A shock-proof handle is now being installed on the release valve which, it is claimed, makes the operation easy, simple and pleasant for the operator.

The release valve is used on the pump manifold to release pressure on the rotary hose when making connections. It also reduces difficulties usually encountered with stop cocks or release valves used on slush pumps.

(Continued from Page 13)

installation represents the soundest plant investment from every standpoint. The designers of cracking and polymerization plants, it is pointed out, are no longer in the experimental stage in which cost allowances had to be made for the mysterious "bugs" that threatened losses. It is now possible, they say, to build a plant for the production of high grade motor fuel at a cost which is amortized within as little as a year of operation.

## Light Metals

Industrial possibilities, hitherto undreamed of, lie in the potential usefulness of light metals, engineers believe. Engines so light that they can "float" are considered feasible through the use of lithium, lightest of all metals, alloyed with aluminum, fatigue-resistant beryllium and lead, to give hardness.

The world's largest supply of lithium is found in a 25-mile vein running between North and South Carolina. Quantities of the ore are in South Dakota, also. In the Tennessee Valley, there are available mineral and power resources, it is believed, to make in one operation smokeless powder and three light metals —magnesium, calcium and lithium.

Fastest tanker afloat has an 18-knot speed and is equipped with special oil carriers for navy use during emergencies.

## W. C. Kinder Manager D & B California Sales

Emsco Derrick & Equipment Co. of Los Angeles announce the appointment of William C. "Bill" Kinder as manager of California sales of their D & B Division.

W. C. "Bill" Kinder

Mr. Kinder's fourteen years of experience has made him one of the best known sucker rod salesmen in California. In 1925, following the completion of three years' work in the fields, he started his career as a salesman for the Axelson Manufacturing Co. of Long Beach. Five years later he resigned to join the Universal Rod and Equipment Co., who at that time had secured the distribution of Bethlehem rods in California. In 1933, when the exclusive distribution rights of Bethlehem rods were acquired by Republic Steel, Mr. Kinder terminated his connections with Universal and joined the Republic organization. Here he was placed in charge of sucker rod sales and he remained in that capacity up to the time of his recent resignation to join the D & B Division of Emsco Derrick & Equipment Co.

Mr. Kinder's first assignment in his new position was an extensive field trip visiting D & B's field stores in the Basin, Coastal and Valley districts with E. E. Stevenson, vice-president and manager of the D & B Division.

A former secretary of the Los Angeles Basin Chapter of A.P.I., Mr. Kinder is now completing his second year of service on the Chapter's Advisory Committee.

## M. O. Johnston Acquires Sub-Surface Pressure Survey

M. O. Johnston Oil Tools, Inc., Los Angeles, Calif., has recently acquired the Sub-Surface Pressure Survey service previously conducted by Commander W. H. Osgood, former retired naval officer who has been recalled to active duty. It is planned to expand this service to supply the ever increasing requirements of this type of work and carefully maintain the high standard of accuracy and confidence always associated with this service under Commander Osgood.

The Johnston Bottom Hole Pressure Recorder which is run in conjunction with the Johnston Formation Tester, obtains the earliest possible record of pressures in a newly exposed sand in a drilling well. The Sub-Surface Pressure Survey Service offers the operator a means of continuing that pressure record after the well's completion by periodic runs throughout its economic life. Instruments are available for use in flowing, gas-lift, or pumping wells.

New instruments are now in the course of development in Johnston's laboratory and will be added to this service from time to time. One of these will serve as a check on the depth pressure record obtained on each run to insure maximum accuracy of results. Others, which will serve to measure various physical properties of well fluids, will be announced in the near future.

The Johnston company is fully qualified to handle this type of service having had years of experience in the manufacture and operation of pressure recorders and has complete facilities for the testing, calibrating, and repairing of instruments of this type. Computation of the results obtained for the study of production problems or the establishment of well potentials by the depth pressure methods will be made as required by the operator at no extra charge.

Tuboscope crews inspect pipe interiors under all conditions.

## Martin-Decker Appoints New Mid-Continent Salesman

Martin-Decker Corp., Long Beach, Calif., has announced that Dave Waters, formerly with Reed Roller Bit Co. at Shreveport, La., has been appointed salesman for Martin-Decker Products in Illinois, Kansas and Oklahoma.

Dave Waters

Mr. Waters is a graduate of the University of Alabama, has had four years field experience with the Humble Oil and Refining Co., and for two and a half years has been a member of Reed Roller Bit Co. sales staff at the Shreveport Branch.

Mr. Waters is now at Martin-Decker's Main Plant at Long Beach, learning about the design, assembly and operation of Martin-Decker oil field instruments, and expects to be located in his new territory in a few weeks.

## Roads Safer, Enduring, "Buttered" With Asphalt

"In order to increase the useful life of the older concrete pavements which often carry heavy traffic with resultant surface wear," reports the Michigan State Highway Department, "the maintenance division during the past five years has adopted a program of bituminous treatments not only to protect the pavement but to provide a safe and durable riding surface.

"This is called the non-skid surface treatment and it has proved so satisfactory that several municipalities are now using it in the restoration of their worn street pavements."

## Kobe, Inc., Appoints Paul D. Cornelius

Announcement of the recent appointment of Paul D. Cornelius to the staff of the Mid-Continent Division, in the capacity of sales engineer for Kobe Hydraulic All-Purpose Pumps, has just been made by C. J. Coberly, president of Kobe, Inc. of Huntington Park, Calif.

Paul D. Cornelius

Active in the producing branch of the petroleum industry for a number of years, Mr. Cornelius has had wide experience in pumping operations and is well known to oil men throughout the Mid-Continent and Gulf Coast fields. Following service with the United States Marine Corps during the World War, he attended the University of Kansas receiving his B.S. degree in 1923. After his graduation he joined the San Francisco office of the Sullivan Machinery Co., being advanced to the St. Louis offices four years later, in which positions he was engaged in sales and engineering work in the construction, mining and industrial fields. In 1933 he was made manager of the Pumphead Division.

While working out of the Mid-Continent Division offices at Oklahoma City under the direction of Division Manager C. M. Rader, Mr. Cornelius will make his headquarters at Kilgore, Texas, in order that he may be able to devote a large portion of his time to the company's activities throughout the East Texas territory.

## Brown Instrument Announces Improved Line of Gauges

An entirely new and improved line of temperature and pressure recorders, indicators and controllers has just been placed on the market by The Brown Instrument Co., Philadelphia, Pa. These instruments include thermometers indicating and recording types for temperatures from —40°F. up to 1200°F.; and indicating or recording pressure and vacuum gauges for ranges from 6 lbs. of water up to 2500 lbs. per square inch and on vacuum ranges of 10 inches of mercury and over. All types are offered in one, two or three pen models.

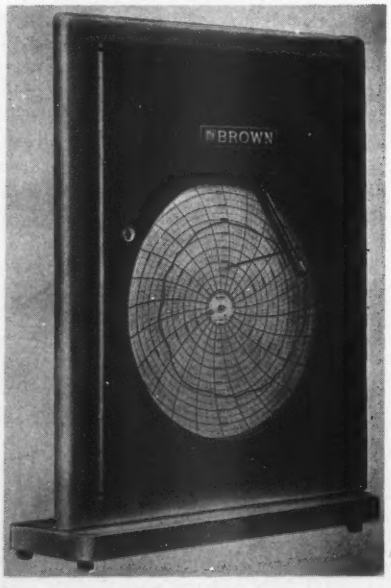
Advanced design of the operating mechanisms, in this new line of rectangular case instruments, is the result of years of research and field testing under actual operating conditions by Brown Engineers.

The classic, simple lines of the modern, streamlined rectangular case—styled by Henry Dreyfuss, designer of the "Twentieth Century Limited" — give added beauty and distinction to these practical and serviceable instruments.

The powerful, flat, spiral actuating elements have ample pen torque without sacrificing speed of response. Especially heat-treated to insure permanent calibration, they have exceptional overrange capacity, the makers say.

A special safety link between actuating element and pen provides an overload safeguard protecting the mechanism from damage if the pen is moved in either direction manually.

Chart is firmly secured to driving mechanism by tapered stud and tapered chart positioning stud, eliminating chart knob and chain. Charts, when renewed, are automatically in time, as the tapered position stud is in effect the hour hand of the electric clock. If current failure makes it necessary to reset chart to correct time line, a friction clutch permits manual rotation for chart setting.




Other features listed include:

1. Pen shaft has sturdy outboard bearing, with hardened pivots, mounted on rigid casting; unaffected by vibration.

2. Longer pen arm, 8", permits pen travel of 4¾". Easily removed and replaced, with no effect on calibration, micrometer adjustment assures precision setting.

3. Resilient Mounting—A rigid, flat sub-plate with 3-point resilient suspension mounting carries all moving parts. Insures permanent alignment — even though case mounting is distorted, accuracy is unaffected.

4. Chart clips, mounted on door, an integral part of shield which conceals operating mechanism.

5. Adaptor Block—designed to permit easy removal of actuating element for replacement or change of range by user.

A new bulletin No. 2-17, completely describing this new line of instruments, has just been issued and a copy will be sent promptly on request. Readers should address their request to The Brown Instrument Co., Wayne and Roberts Avenues, Philadelphia, Pa.

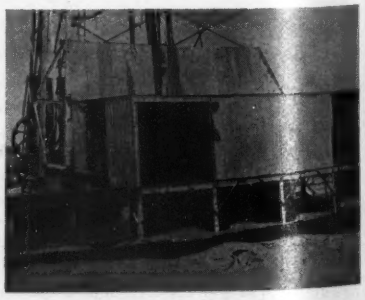
## Manhattan Rubber Issues Catalogue for Industry

Printing of the fourth edition of "Manhattan Rubber Products for Industry," a condensed catalogue of mechanical rubber goods, has been completed by The Manhattan Rubber Mfg. Division, 94 Townsend St., Passaic, N. J. Copies available on request.

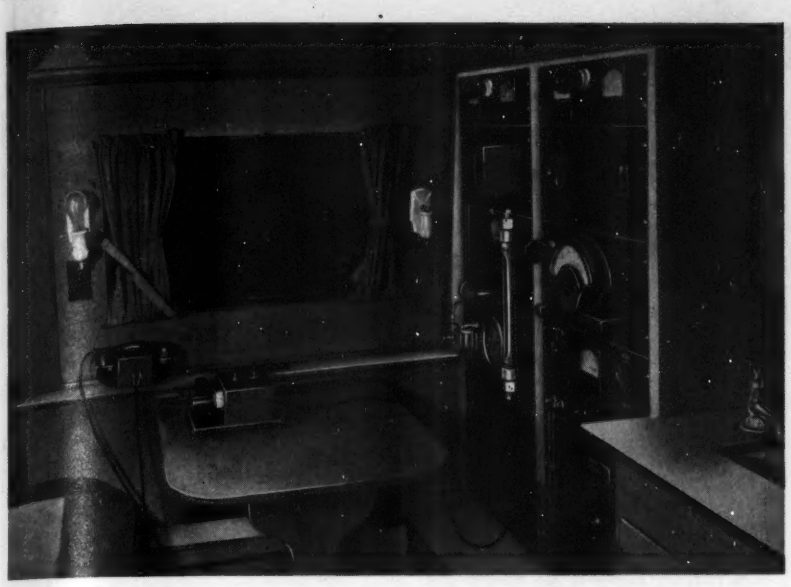
Described in this new catalogue are hundreds of mechanical rubber products and special items manufactured by Manhattan. Particular emphasis is given belting, hose, packing, molded rubber goods, industrial asbestos friction material, rubber roll coverings, tank linings, and abrasive wheels. The catalogue also contains transmission belt engineering data and technical information on other products.

### LANE-WELLS DIVIDEND

Directors of Lane-Wells Co. have declared a quarterly dividend of 25 cents a share on the common stock, payable Sept. 15 to stock of record Aug. 30.



Ideco Sectional Type Steel Engine House.



## Baroid Announces Well Logging Service

Baroid has developed a Well-Logging Service which is based on the principle that the oil, gas, or salt water content of any formation drilled up by the bit must necessarily be picked up by the drilling mud as it is circulated during drilling. If, then, any unit volume of the drilling mud, upon returning to the surface, is subjected to the necessary tests and the content of that unit volume is accurately correlated with the depth of the hole at the time that particular unit volume of mud was passing the bit, not only is it possible to determine whether or not that particular part of the formation being drilled contains gas, oil, or salt water, but it is even possible to determine the relative quantities contained in that part of the formation.

More than forty wells have been drilled to date using this method and the results obtained have given the operator much more information than he has been able to obtain before. It also has resulted in such a marked saving in time and expense that it appears likely that the method will have a wide application in future drilling, Baroid engineers say.

The equipment necessary to make the tests which disclose the desired information is mounted in a trailer which can be easily moved from one location to another.

A gas detector of extremely sensitive design is supplied which allows a full scale reading with as little as one cubic inch of gas per hour. A very important development in connection with the use of the gas detector is that it has been found that while drilling, indications of an approach to oil and gas sands can be obtained fifteen or twenty feet before the sands are actually encountered.

An ultra-violet light, oil detection device enables the operator to detect small oil sands of a couple of feet in thickness. In this way small commercial deposits are located which otherwise might be overlooked. A correction factor is also used for evaluating the oil readings, which depends upon the rate of drilling, the diameter of the hole, and the rate of mud circulation.

Another important piece of equipment is the apparatus used for logging salt water. The method used consists of placing electrodes in the ingoing and outgoing mud and comparing the resistances, making proper allowance for the time taken for any increment of the mud stream to traverse the subsurface circulating system. A resistance measuring bridge automatically corrects the readings for temperature.

A depth recorder will show automatically the total depth of the well at all times, and in addition thereto the depth of the bit at any given time. The depths shown on the recorder are accurate to within a few inches. A drilling rate meter functioning in connection with the depth recorder will also be provided. This instrument automatically draws a log which corresponds somewhat to the porosity curve on an electrical coring log.

A pump stroke counter and a rate meter for determining the rate at which the pump is running in complete cycles per minute, enables the operator to relate the findings of the other instruments to the depths to which they apply. The instrument measures the quantity of mud circulated which is necessary because of the lag between the time the sample of the mud passes the bit and the time it reaches the surface and is analyzed. One of the most important uses of the pump stroke counter is its ability to give almost infallible warning of washouts. When a washout starts, the pump rate commences to increase slowly, until failure of the pipe occurs. This speeding up, being slow, is almost imperceptible to the driller but is easily noted on the pump stroke counter. Speed changes due to variations in boiler pressures are easily distinguished from those due to an incipient washout because changes due to boiler pressure are up and down and of small amplitude, while the change due to a washout is a steady increase. Where this instrument has been used on rigs, the operator has been able to warn the driller when a washout has commenced and thus enabled the pipe to be pulled and the washout located before failure occurred, thus saving a potentially expensive fishing job. Other variances in the readings of the instrument will indicate caving, or that circulation is too slow, or the mud not sufficiently thick to carry cuttings to the surface which might result in stuck drill pipe.

Complete core analysis equipment is also furnished in the trailers which enable the operator to test the porosity and permeability of any cores he may take.

A new fully illustrated bulletin describing the Baroid Well-Logging Service Equipment and procedure in graphic detail may also be obtained at Baroid Sales Department offices at Los Angeles, Houston, or Tulsa.

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## O. F. Collinge Adds to Interests

O. F. Collinge, operating in the oil and gasoline brokerage business in Los Angeles, has, it has been announced, purchased the interests of W. C. van Fleet and W. P. Durkee in Allyn Tank Lines and O. F. Collinge & Co.

The new company will be known as O. F. Collinge, Incorporated.

Mr. van Fleet and Mr. Durkee, veterans in the oil business and well known on the Pacific Coast, will continue their own association confining their activities to crude production.

O. F. Collinge Inc., under the personal supervision and management of O. F. Collinge, will continue its brokerage business, dealing principally in export; as also Allyn Tank Lines which operate a fleet of oil tank trucks in Southern California, and which is currently hauling for General Petroleum, Standard Oil and Shell.

# Business and Professional Directory


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of
CALIFORNIA

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MIchigan 8781

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Consulting Geologist
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M. H. SOYSTER
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Since 1904
Oils Tested
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CORE ANALYSIS LABORATORY
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Specializing in the physical determination of porosity, permeability, oil and water saturation of core samples.
P. O. Box 461 Telephone
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Reconditioned or new heat exchangers, stills, fractionators, absorbers, condensers, at cut prices. Plants designed any size for any use. W. F. Pyne, 909 Ardmore Ave., Los Angeles. DRexel 1412. tf

MAPS
Large maps of Los Angeles Basin oil fields and map showing all California oil fields. Price $15.00 each on paper and $20 each on cloth. Individual state oil and gas maps of Mid-Continent and Rocky Mountain regions. Maps show geological cross sections at base. These maps indicate wells drilling, wells producing and abandoned, with depths.
All maps revised up to date of purchase.
JAMES C. BRANSFORD
1127 Story Bldg.
Los Angeles, Calif.
Phone: TUcker 7530


## Oil Men's Calendar

C.N.G.A. Meeting First Thurs. Each Month.

October

4-6—American Institute of Mining & Metallurgical Engineers, Petroleum Division, Galveston, Tex.

9-10—American Gas Assn., Annual Convention, New York.

16-20—National Safety Congress and Exposition, Chalfont-Haddon Hall, Atlantic City.

Week of 16—40th Annual National Automobile Show, Grand Central Palace, New York.

Week of 16—National Tax Conference, Palace Hotel, San Francisco, Calif.

19-20—American Institute of Mining & Mettallurgical Engineers, Petroleum Division, Los Angeles, Calif.

November

8-16—National Motor Truck Show, Navy Pier, Chicago, Ill.

13-17—American Petroleum Institute, 20th Annual Meeting, Stevens Hotel, Chicago.

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Oil producers are planning new wells to be drilled to five-mile depths.

## California Crude Oil Production

Two Weeks Ended August 12, 1939

| | August Daily Quota | Average Daily Production | Excess |
|---|---|---|---|
| **San Joaquin Valley** | | | |
| Belridge—North | 13,433 | 11,359 | *2,074 |
| Belridge—South | 2,144 | 1,187 | *957 |
| Buena Vista | 17,224 | 15,612 | *1,612 |
| Canal | 5,795 | 5,239 | *556 |
| Coalinga-East(Eocene) | 7,440 | 8,312 | 872 |
| Coalinga—East-West | 16,140 | 12,201 | *3,939 |
| Edison | 2,231 | 2,494 | 263 |
| Elk Hills | 7,812 | 10,367 | 2,555 |
| Fruitvale | 6,178 | 6,254 | 76 |
| Greeley | 2,910 | 2,241 | *669 |
| Kern Front | 7,538 | 7,240 | *298 |
| Kern River | 8,530 | 3,362 | *5,168 |
| Kettleman No. Dome | 35,652 | 50,847 | 15,195 |
| Lost Hills | 4,141 | 3,304 | *837 |
| McKittrick | 3,927 | 3,678 | *249 |
| Midway | 37,990 | 30,379 | *7,611 |
| Mount Poso | 10,430 | 12,980 | 2,550 |
| Mountain View | 9,418 | 9,792 | 374 |
| Rio Bravo | 7,680 | 7,898 | 218 |
| Round Mt. and Coffee Canyon | 8,068 | 8,734 | 666 |
| Ten Section | 9,187 | 8,946 | *241 |
| Wasco | 1,205 | 1,229 | 24 |
| Other Fields | 3,957 | 3,910 | *47 |
| TOTAL | 229,030 | 227,565 | *1,465 |
| **Coastal Counties** | | | |
| Elwood | 3,975 | 4,098 | 123 |
| Rincon | 2,483 | 2,406 | *77 |
| Santa Maria | 8,470 | 3,785 | *4,685 |
| Gato Ridge | 2,552 | 2,622 | 70 |
| Santa Maria Valley | 19,678 | 10,300 | *9,378 |
| Santa Paula-Newhall | 5,739 | 5,804 | 65 |
| Ventura Avenue | 31,064 | 36,221 | 5,157 |
| Other Fields | 5,335 | 5,593 | 258 |
| TOTAL | 79,296 | 70,829 | *8,467 |
| **Los Angeles Basin** | | | |
| Alamitos-Seal Beach | 7,042 | 6,762 | *280 |
| Brea-Olinda | 8,372 | 5,713 | *2,659 |
| Coyote—East | 3,139 | 2,587 | *552 |
| Coyote—West | 10,383 | 9,954 | *429 |
| Domingues | 16,421 | 18,393 | 1,972 |
| El Segundo | 3,143 | 3,260 | 117 |
| Huntington Beach—New and Old | 23,129 | 25,881 | 2,752 |
| Inglewood | 12,558 | 12,768 | 210 |
| Long Beach | 41,652 | 46,042 | 4,390 |
| Montebello | 6,044 | 6,262 | 218 |
| Montebello-West End | 10,180 | 15,270 | 5,090 |
| Playa del Rey | 4,657 | 4,724 | 67 |
| Richfield | 7,662 | 8,445 | 783 |
| Rosecrans-Athens | 9,187 | 10,794 | 1,607 |
| Santa Fe Springs | 25,437 | 28,002 | 2,565 |
| Torrance | 5,532 | 5,217 | *315 |
| Torrance "34" and "D & B" | 10,258 | 12,200 | 1,942 |
| Wilmington | 79,702 | 85,228 | 5,526 |
| Other Fields | 3,449 | 3,983 | 534 |
| TOTAL | 287,947 | 311,485 | 23,538 |
| STATE TOTAL | 596,273 | 609,879 | 13,606 |

*—Shortage.

CALIFORNIA
OIL WORLD
and Petroleum Industry

Presents

# SIXTY YEARS OF FAMILY LIFE

## A Story of

## STANDARD OIL COMPANY

## OF CALIFORNIA

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TECHNICAL DEPARTMENT
TULSA, OKLAHOMA

Second Issue August 25, 1939 Part II

IN recording the history of the Standard Oil Company of California in its sixtieth anniversary year, it has been our privilege to talk to roustabouts in the field, Directors in the office, pipe-line walkers, welders, refiners, salesmen and engineers. From them, we have gained a first-hand and intimate knowledge of the Standard Oil Family—its ties, its ramifications and the loyalty it commands. And, as we have written, the Family Spirit we have found, at every turn, is a very real and positive thing—a basic part of the intricate pattern of Standard of California.

This Family Spirit is, of course, the out-growth of broad-gauge policies of employee-relationships. The Standard Oil Company adopted them many years ago; so, in fact, did most of the companies that form the California oil industry. Today, they are an industry characteristic; which perhaps explains why the petroleum industry of this state has, like the Standard, enjoyed almost uninterrupted progress since its beginnings sixty years ago.

We have traced the history of this great industry in terms of the company which has been its undisputed leader since 1879. The industry, like its leader, has plowed new fields and crossed new horizons and there written a new chapter in industrial history.

*Had we told the story of the industry as a whole, the details would have been different but the tenor would have been the same.*

# Foreign Operators

RED

# H.C.SMITH

## DULL CUTTERS CAN
## REPLACED WITH NEW
## ASSEMBLIES IN YOUR
## SHOPS AT A SUBSTANTIAL SAVIN

H. C. Smith Rock Bit

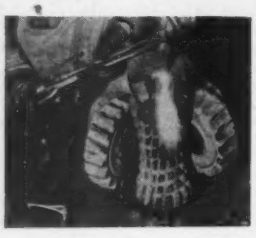


Fig. 1. Cutting out cross assembly with acetylene torch.

Fig. 2. Replace dull gauge cutters by screwing new gauge cutters on bit body.

Fig. 3. Gauge cutter assemblies being tightened with wrench placed in pin holes.

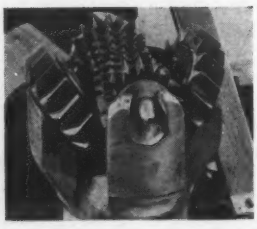


Fig. 4. Cross cutter assembly placed in position, now ready for welding.

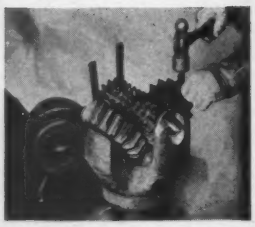


Fig. 5. Placing clearance shims behind thrust washer before welding.

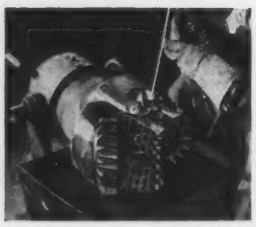


Fig. 6. Welding bit.

### REMOVAL AND INSTALLATION OF H. C. SMITH ROCK BIT CUTTERS

*TO REMOVE a dull cross cutter from an H. C. Smith Rock Bit cut out the cross assembly weld with an acetylene torch (Fig. 1), being careful not to cut into the bottom of machined slot in the body leg—for the proper depth must be maintained for a new assembly.*

*TO REMOVE gauge assembly cut spot weld of gauge cutter thrust washer to bit body with acetylene torch, and with the wrench, hammer and helper unscrew assembly. Grind the outside of the bit body leg to remove remains of welding, to be sure new assembly will not bind and will have clearance.*

### ASSEMBLING

*In assembling an H. C. Smith Rock Bit, first place the bit body in a vise to insure a quick and thorough assembly. Secondly, screw both gauge assemblies on threaded pins as far as possible by hand (Fig. 2), then fix the pins in the wrench in the corresponding holes in the assembly and tighten with a three-pound hammer. To prevent the wrench from slipping adjust the helper so that the end is braced under the teeth of the opposite cutter and the handle braced firmly against the wrench (Fig. 3). When this operation on one assembly is completed, remove the wrench and helper and affix them to the other and tighten it in the same manner.*

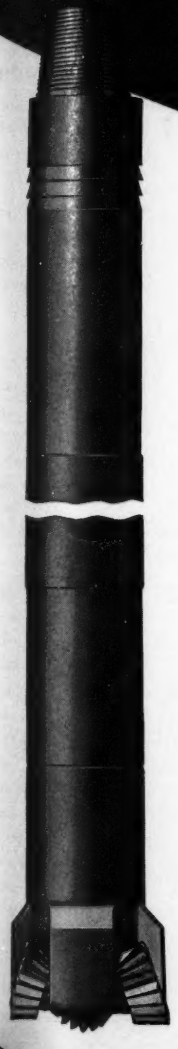
*After gauge assemblies have been tightened on gauge pins as directed the thrust washer (contains a square hole on outside of assembly next to bit body leg) is spot welded to the bit body leg with electric Fleet Arc No. 85 welding rod. Be sure these thrust washers are welded on to the leg for that prevents washer from turning. The cross assembly is dropped into the open slots in the top of the other two bit body legs, with the small center tooth on the bent pin up (Fig. 4). Place shims between cutters and thrust washers to keep washer out close to leg of bit while welding (Fig. 5). Fill in this circular recess leg with No. 85 Fleet Arc Electrodes. While welding the pin to the bit body keep the area as cool as possible so as not to draw hardness out of Cross Pin (Fig. 6). Run two beads, then cool in water, or pour water on the weld after each bead. After completing this weld at both ends of the cross roller assembly pin, knock out the shims between cutters and washers. If cutters do not turn hit the weld with a small sledge hammer until they loosen up. If possible, the cross assembly weld should be ground down to 1/4" below the bottom of the gauge cutter teeth, so that if the bit penetrates deeper than bottom of gauge cutter teeth, the cross section legs would not hold up the bit.*

*(IN THE UNITED STATES, H. C. SMITH ROCK BITS ARE LEASED AND NOT SOLD

# H C Smith Oil Tool Co.

# for Greater Core Recovery use the

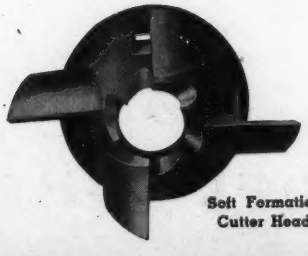
# WIRE LINE



H. C. Smith T-39 Line Core Drill

## FEATURES OF THE H. C. SMITH T-39 WIRE LINE CORE DRILL

- Simple and positive locking of inner barrel while coring and retrieving of barrel after coring operation is completed.
- Improved bearings in cutters which allows longer hours on bottom without loss of hole gauge.
- Heavier pins and body construction for increased safety.
- Improved double core catcher.
- Floating inner barrel.
- Hard and soft formation cutter heads are interchangeable on core drill.



Soft Formation Cutter Head

Hard Formation Cutter Head

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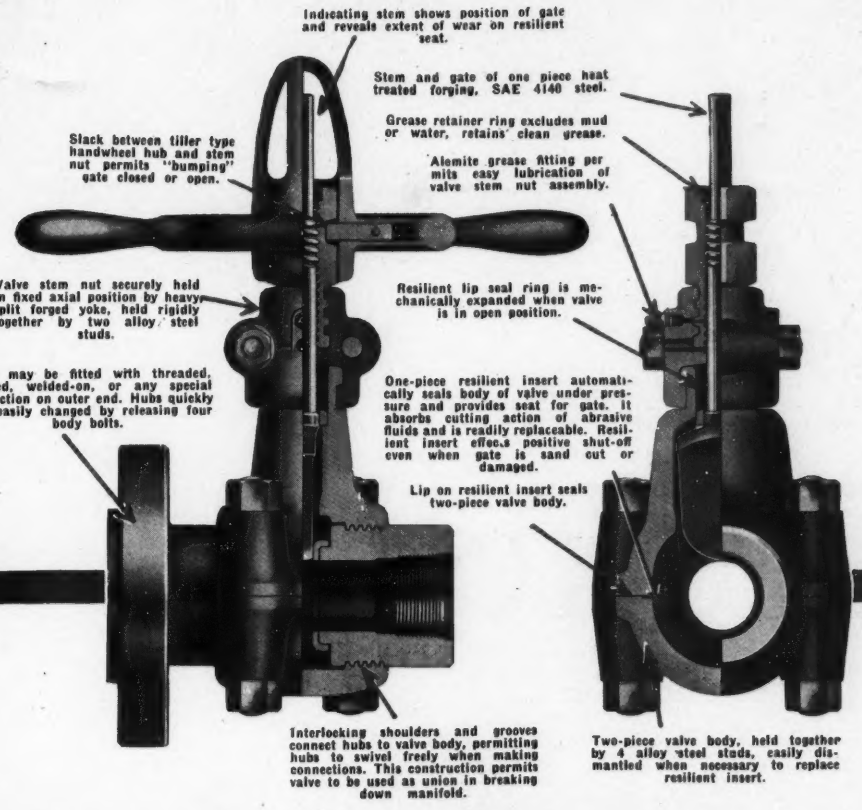
# It's *Our* Birthday — Too

From the day of our organization, twenty years ago, Standard Oil Company of California has looked upon Baash-Ross Tool Company as a supplier of products of consistent merit . . . We in turn have found "Standard" an intelligent, exacting and valued buyer . . . A relationship based upon such sound business principles can and should continue for another twenty years.

# NOW AVAILABLE FROM CALIFORNIA STOCKS

# CAMERON FLEX-SEAL MUD VALVE


Indicating stem shows position of gate and reveals extent of wear on resilient seat.
Stem and gate of one piece heat treated forging, SAE 4140 steel.
Grease retainer ring excludes mud or water, retains clean grease.
Alemite grease fitting permits easy lubrication of valve stem nut assembly.
Slack between tiller type handwheel hub and stem nut permits "bumping" gate closed or open.
Valve stem nut securely held in fixed axial position by heavy split forged yoke, held rigidly together by two alloy steel studs.
Resilient lip seal ring is mechanically expanded when valve is in open position.
Hubs may be fitted with threaded, flanged, welded-on, or any special connection on outer end. Hubs quickly and easily changed by releasing four body bolts.
One-piece resilient insert automatically seals body of valve under pressure and provides seat for gate. It absorbs cutting action of abrasive fluids and is readily replaceable. Resilient insert effects a positive shut-off even when gate is sand cut or damaged.
Lip on resilient insert seals two-piece valve body.
Interlocking shoulders and grooves connect hubs to valve body, permitting hubs to swivel freely when making connections. This construction permits valve to be used as union in breaking down manifold.
Two-piece valve body, held together by 4 alloy steel studs, easily dismantled when necessary to replace resilient insert.

## The Valve That Saves 93% Maintenance!

The Cameron Flex-Seal Mud Valve, equipped with a unique renewable flow-way insert, has demonstrated a remarkable capacity to withstand the destructive action of abrasive-laden fluid moving at high velocity, and to seal positively even after long periods of service. Unbiased field tests, under the most severe conditions, have definitely proved that the Cameron Flex-Seal Mud Valve actually requires 93% less maintenance than conventional types of gate valves and stop cocks.

At a very slow rate of wear, the resilient insert absorbs the cutting action of abrasive-laden fluid. When the insert is eventually worn out, it may be replaced quickly and at low cost in the field by the drilling crew. In the full open position, the heat-treated alloy steel gate is retracted out of the flow-way, and even though the gate may be sand-cut or damaged, after long service, positive shut-off is effected when it is embedded in the resilient insert. The valve opens and closes with ease under full rated test pressure of 6000 lbs.

California operators who are experiencing mud valve trouble are invited to try the Cameron Flex-Seal Mud Valve, which is now available in California through

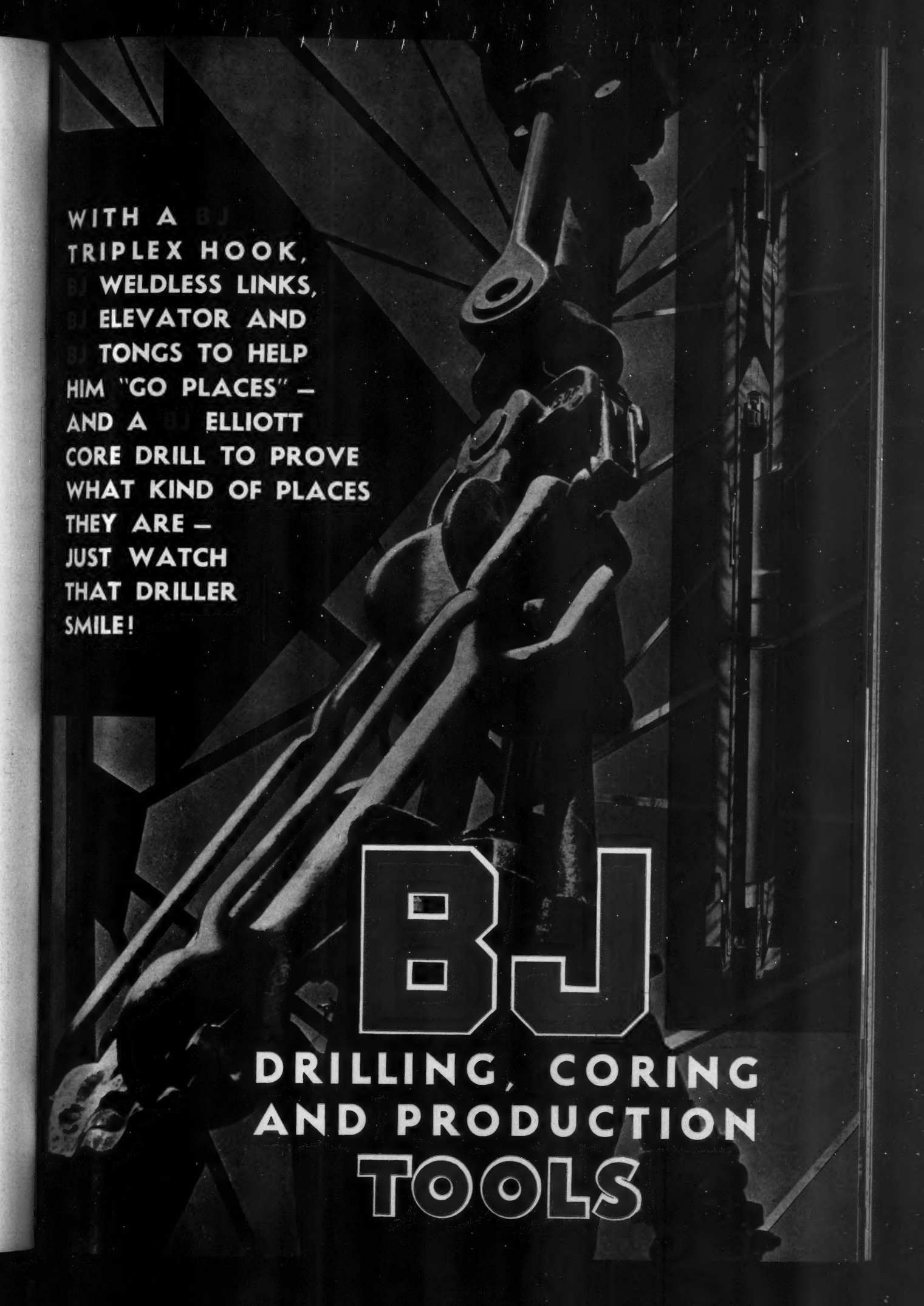
THE HOWARD SUPPLY COMPANY, Los Angeles

*Or through any recognized oilfield equipment dealer*

Export—74 Trinity Place, New York, N. Y.

CAMERON IRON WORKS, INC., 711 MILBY STREET, HOUSTON, TEXAS

# Axelson


WITH A BJ TRIPLEX HOOK, BJ WELDLESS LINKS, BJ ELEVATOR AND BJ TONGS TO HELP HIM "GO PLACES" – AND A BJ ELLIOTT CORE DRILL TO PROVE WHAT KIND OF PLACES THEY ARE – JUST WATCH THAT DRILLER SMILE!
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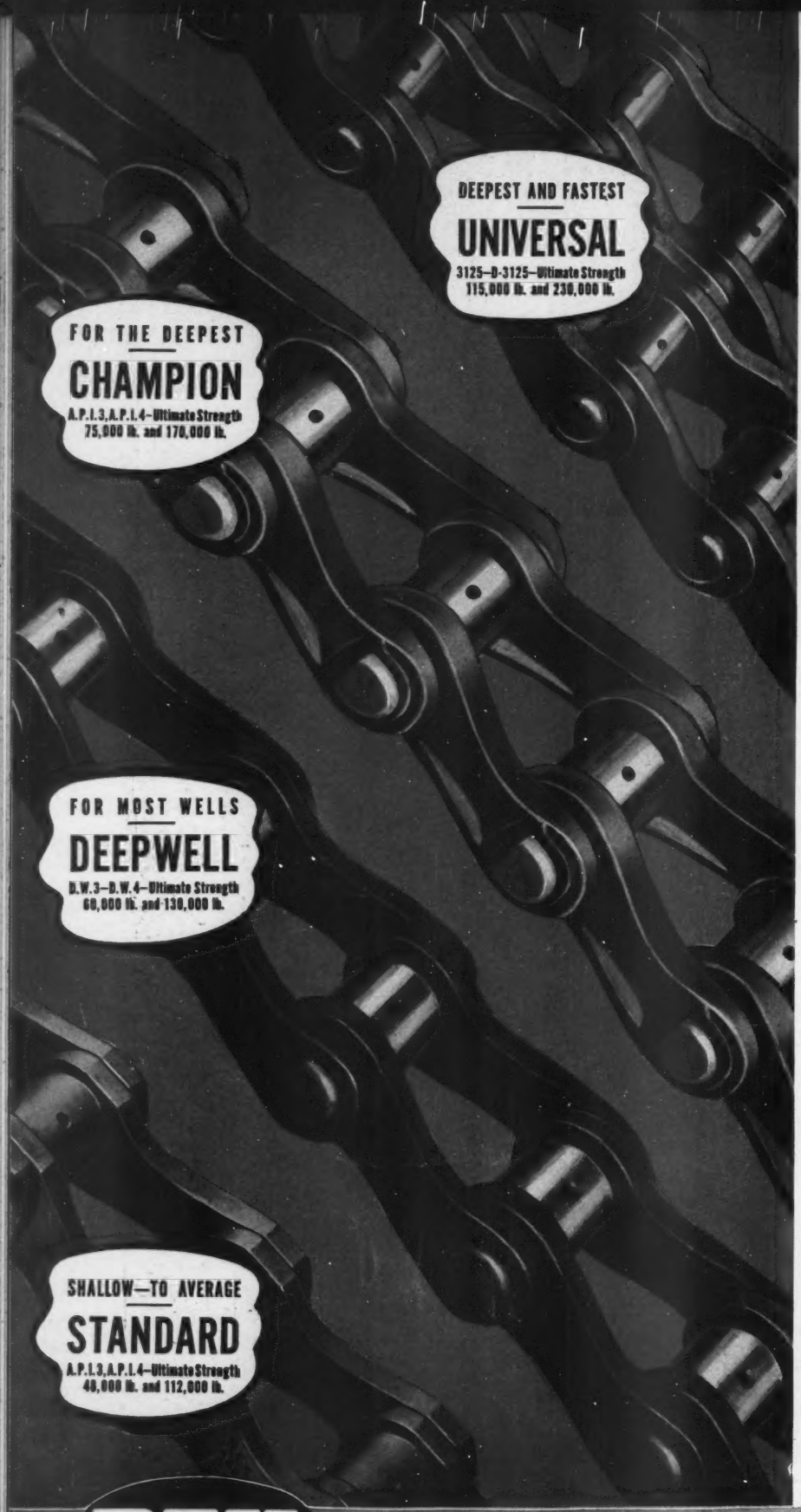
TOOLS




# *Why* UNDERCHAIN OR OVERCHAIN *ON YOUR RIGS?*

## NEITHER IS NECESSARY —BOTH COST MONEY!

When you *overchain* your rigs you increase your cost per foot of hole by using chains that cost more to buy and take more power to operate. When you *underchain* your rigs you're inviting early chain failure and costly on-the-job interruptions. Both are equally unnecessary!

Analyze your average speed, power, depth of hole and type of drilling. From the Rex Chabelco line you can get the chain that meets the widest range of your drilling work. Each chain in the Chabelco line gives you "Rexclusive" advantages that include matched "flats" on the pins and the side bar holes that defeat destructive rocking, plus effective lubricating methods that send oil to all moving parts to make Rex Chains last longer on any rig.

The Rex way to lower cost per foot of hole is further explained in the Rex Oil Well Chain Data Book which also gives usable information on the application and maintenance of any oil well drilling chain. Send for your copy today. Address the Chain Belt Company, 1627 W. Bruce St., Milwaukee, Wis.

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# OVER ONE THOUSAND WELLS

So outstanding has been the success of "Securaloy" Drillable Pipe that it has been installed in over one thousand wells thus far . . . and the number is pyramiding faster every day!

These more-than-a-thousand wells represent practically every conceivable oil field condition. Some have highly corrosive fluids . . . some have bad sand conditions . . . some have difficult combinations of high and low pressure producing zones . . . and some are unusually deep, ranging down to the world's deepest wells where "Securaloy" equipment has been used at depths in excess of 13,000 feet!

In many of these wells the "Securaloy" equipment has already been drilled up—quickly, smoothly and economically—to make way for further development operations. In some installations the "Securaloy" was used to aid cementing operations and was drilled up almost as soon as it was installed. In others, the "Securaloy" was drilled up only after a long period of service (one of the very first "Securaloy" installations is still in use, giving perfect service) . . . and then only to make way for further development operations. *But in all cases, the "Securaloy" equipment was removed from the well without the expense and risk of a fishing job—a point of vital importance!*

And what is even more interesting, many of these more-than-a-thousand wells were developed by revolutionary methods that were never before feasible until the drillable feature of "Securaloy" made them practical methods that saved money and produced *better* wells at *less* cost.

When "Securaloy" was first placed on the market, it was one of the most thoroughly pre-tested products ever offered the oil industry. And since that time it has been even more thoroughly tested and proved in general use by oil men all over the world and under almost every conceivable operating condition.

Probably the very "Securaloy" installation you are wondering about for your well has already been successfully performed in a number of wells in other fields. Consult our Engineering Department. You will find them always ready to apply their widespread experience to the solution of your particular problem.

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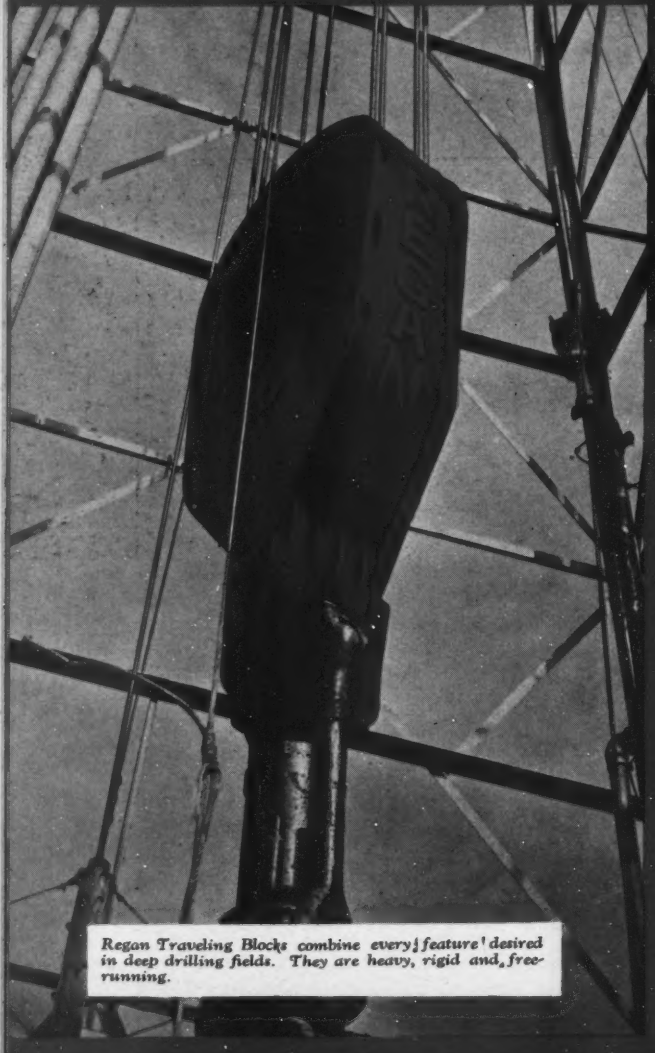
# YOU KNOW IT'S A Regan



*Regan Traveling Blocks combine every feature desired in deep drilling fields. They are heavy, rigid and free-running.*

*Only Regan Blocks have dual bearings and rotating pins, making possible faster operation with less friction and reducing wire line slippage to a minimum.*

## These Big Red Crown and Traveling Blocks Loom Out in Every Oil Field

Year after year, Regan equipment keeps pace with the forward march of the oil industry. As wells go deeper and deeper, Regan engineers continue to design bigger, sturdier blocks to meet the demand for equipment that will stand up under every drilling condition. Throughout the California fields, in fact, throughout the oil fields of the world, the name "Regan" is synonymous with well-engineered, accurately built crown blocks, traveling blocks and control equipment. Full information upon request, or refer to the Composite Catalog.

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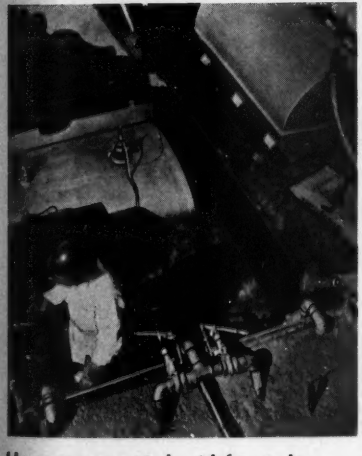

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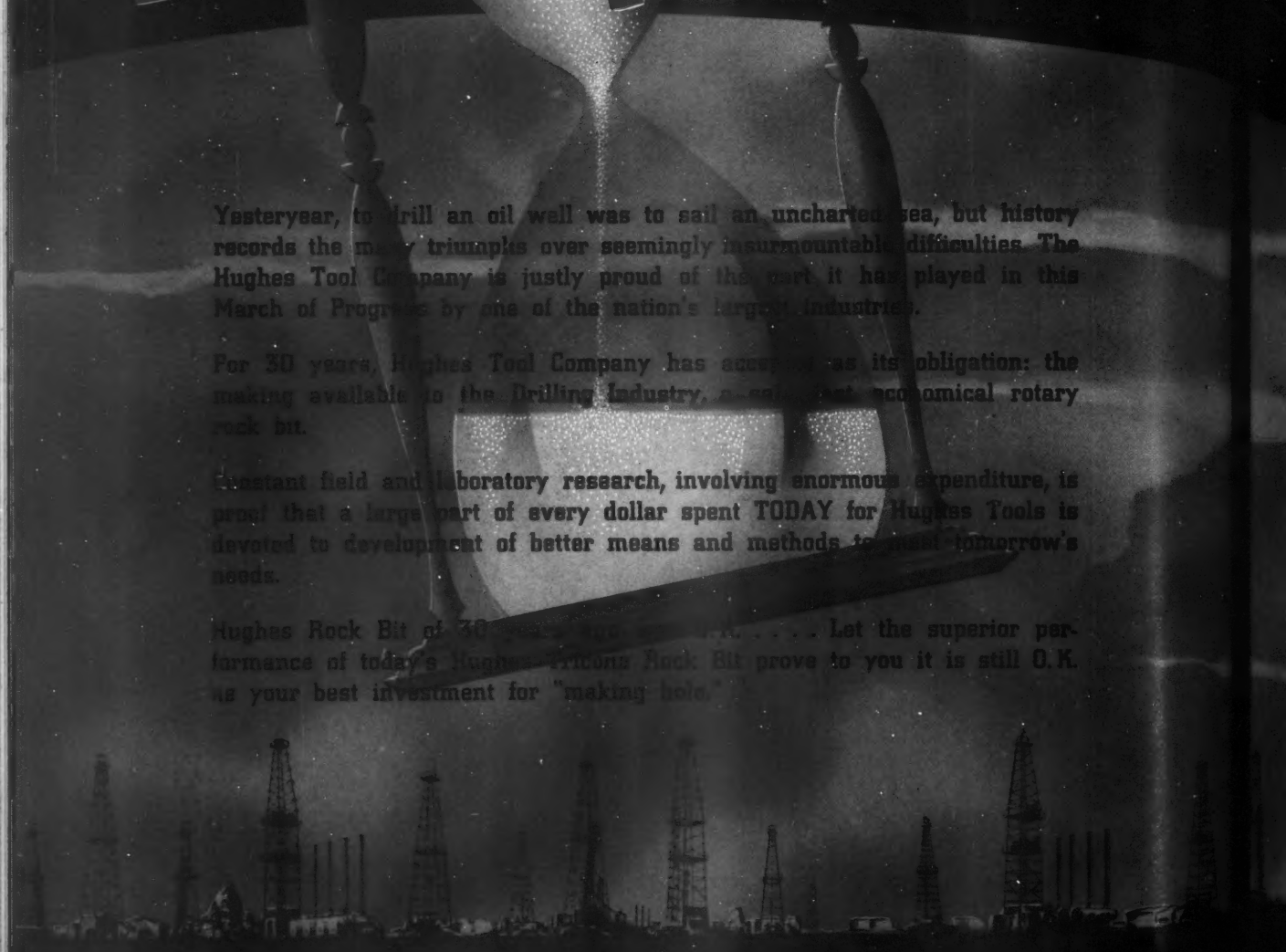
## HUGHES Rock Bit Performance



Yesteryear, to drill an oil well was to sail an uncharted sea, but history records the many triumphs over seemingly insurmountable difficulties. The Hughes Tool Company is justly proud of the part it has played in this March of Progress by one of the nation's largest industries.

For 30 years, Hughes Tool Company has accepted as its obligation: the making available to the Drilling Industry, at all times, most economical rotary rock bit.

Constant field and laboratory research, involving enormous expenditure, is proof that a large part of every dollar spent TODAY for Hughes Tools is devoted to development of better means and methods to meet tomorrow's needs.

Hughes Rock Bit of 30 years ago was O.K. . . . Let the superior performance of today's Hughes Tricone Rock Bit prove to you it is still O.K. as your best investment for "making hole."

HUGHES TOOL COMPANY

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Today . . . . there is a Hughes Rock Bit, especially designed for rock formations . . . . from broken shales to pyrites, there is a Hughes "Tailor Made" Rock Bit with special tooth construction and design to best "fit" the formation. Proven results are: more footage per bit . . . . faster time . . . . straighter full gage hole . . . . and saving of many round trips.
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IT ISN'T EASY, this service business. But it has its good features. GOOD SERVICE seems to draw good customers; good customers come back steadily for more good service. And the harder we work, the more we seem to give satisfaction and the more we are able to do for our customers.

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The above battery of ten Ingersoll-Rand XVG, 4-cycle gas-engine compressors are in a recycling, gas booster and gas-lift plant of The Superior Oil Company, Kettleman Hills, California. These units have already given 3½ years of satisfactory high-pressure service.

Some of the compressor cylinders have been changed to meet the shifting pressure conditions — 450, 700, 1200 and 2000 lb discharge pressures being involved.

This is one of the many high-pressure installations of modern XVG units. Back of every machine is the experience gained through building over 400 high-pressure compressors totalling about 85,000 horsepower for discharge pressures up to 15,000 lb, plus the outstanding reputation of the famous XVG 4-cycle angle design.

## features

- Proved dependability . . . Easy to maintain.
- Shipped fully assembled . . . Low-cost installation and relocation.
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- Variable-speed operation down to half speed, manual or automatic.
- Separate, interchangeable power cylinders.
- Quiet operation.
- Compressor cylinders available for full loading at any pressure combination.
- Regulation for any service conditions.
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*I-R Products include: Diesel and Gas Engines, Pumps, Rock Drills, Pneumatic Tools, and Refrigerating Units.*

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Cardwell Draw Works will "drill-up," eliminating stuck drill pipe and "twist-offs" when cave-in occurs.

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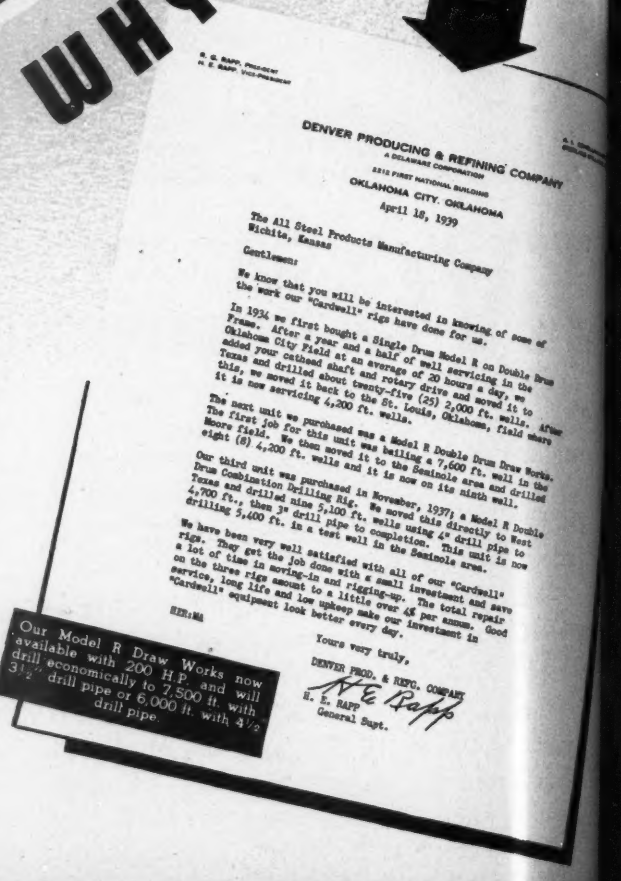
*Give us the formation data that is a problem; we may be able to assist you.*

*Write us today; we'll gladly send you photographs, specifications and prices; or see our nearest representative.*



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2218 FIRST NATIONAL BUILDING
OKLAHOMA CITY, OKLAHOMA

April 18, 1939

The All Steel Products Manufacturing Company
Wichita, Kansas

Gentlemen:

We know that you will be interested in knowing of some of the work our "Cardwell" rigs have done for us.

In 1934 we first bought a Single Drum Model R on Double Drum Frame. After a year and a half of well servicing in the Oklahoma City Field at an average of 20 hours a day, we added your cathead shaft and rotary drive and moved it to Texas and drilled about twenty-five (25) 2,000 ft. wells. After this, we moved it back to the St. Louis, Oklahoma, field where it is now servicing 4,200 ft. wells.

The next unit we purchased was a Model R Double Drum Draw Works. The first job for this unit was bailing a 7,600 ft. well in the Moore field. We then moved it to the Seminole area and drilled eight (8) 4,200 ft. wells and it is now on its ninth well.

Our third unit was purchased in November, 1937; a Model R Double Drum Combination Drilling Rig. We moved this directly to West Texas and drilled nine 5,100 ft. wells using 4" drill pipe to 4,700 ft., then 3" drill pipe to completion. This unit is now drilling 5,400 ft. in a test well in the Seminole area.

We have been very well satisfied with all of our "Cardwell" rigs. They get the job done with a small investment and save a lot of time in moving-in and rigging-up. The total repair on the three rigs amount to a little over $5 per annum. Good service, long life and low upkeep make our investment in "Cardwell" equipment look better every day.

Yours very truly,

DENVER PROD. & REFG. COMPANY
R. E. RAPP
General Supt.

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Our Model R Draw Works now available with 200 H.P. and will drill economically to 7,500 ft. with 3½" drill pipe or 6,000 ft. with 4½" drill pipe.

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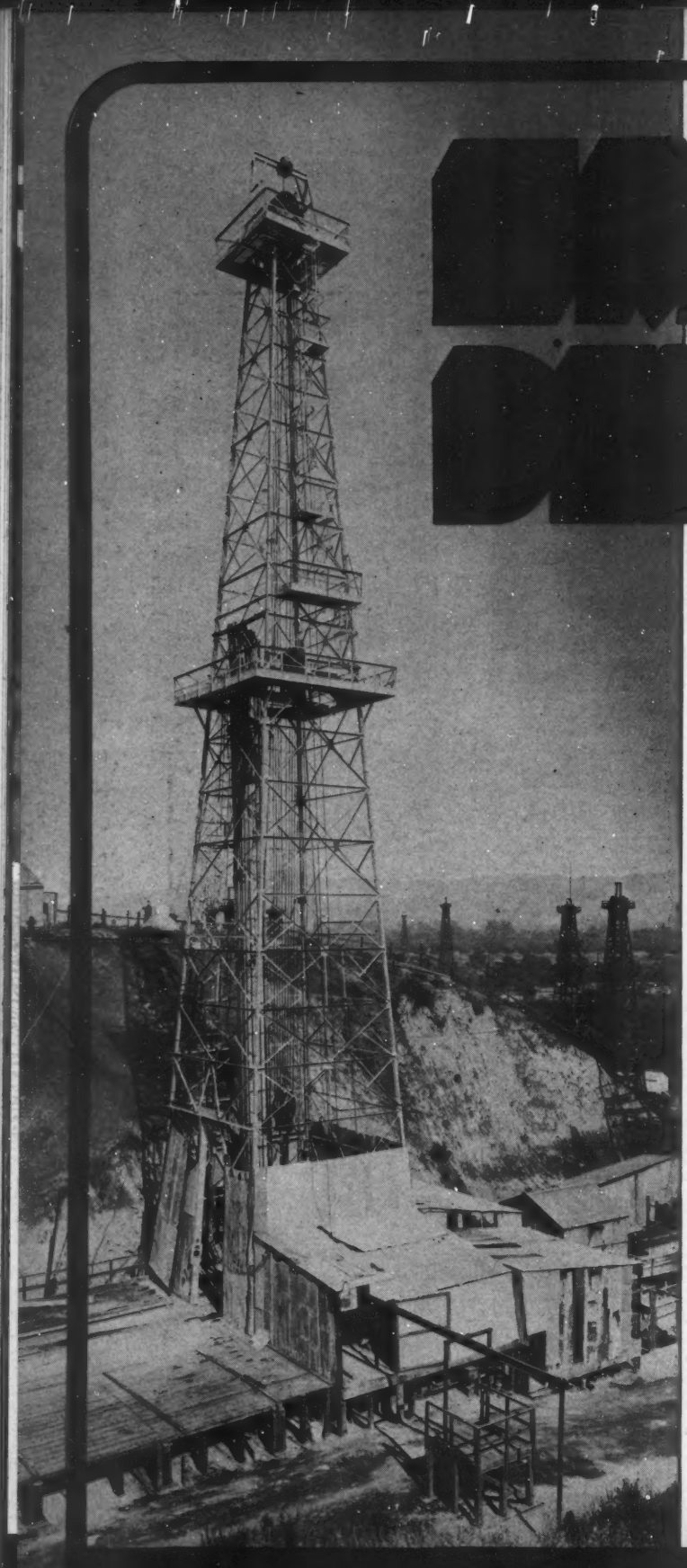

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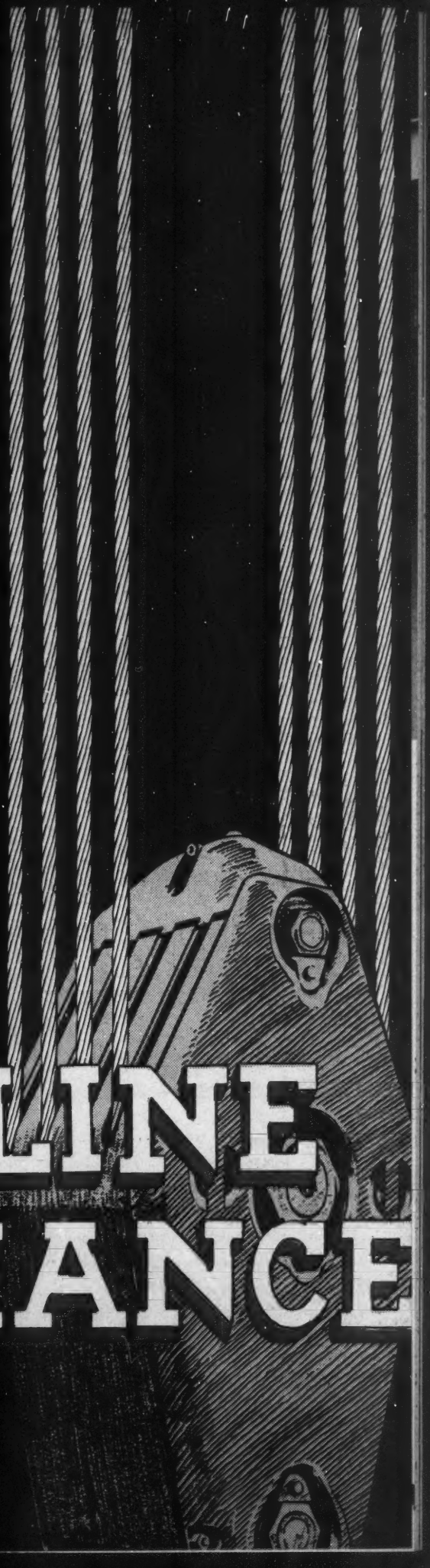
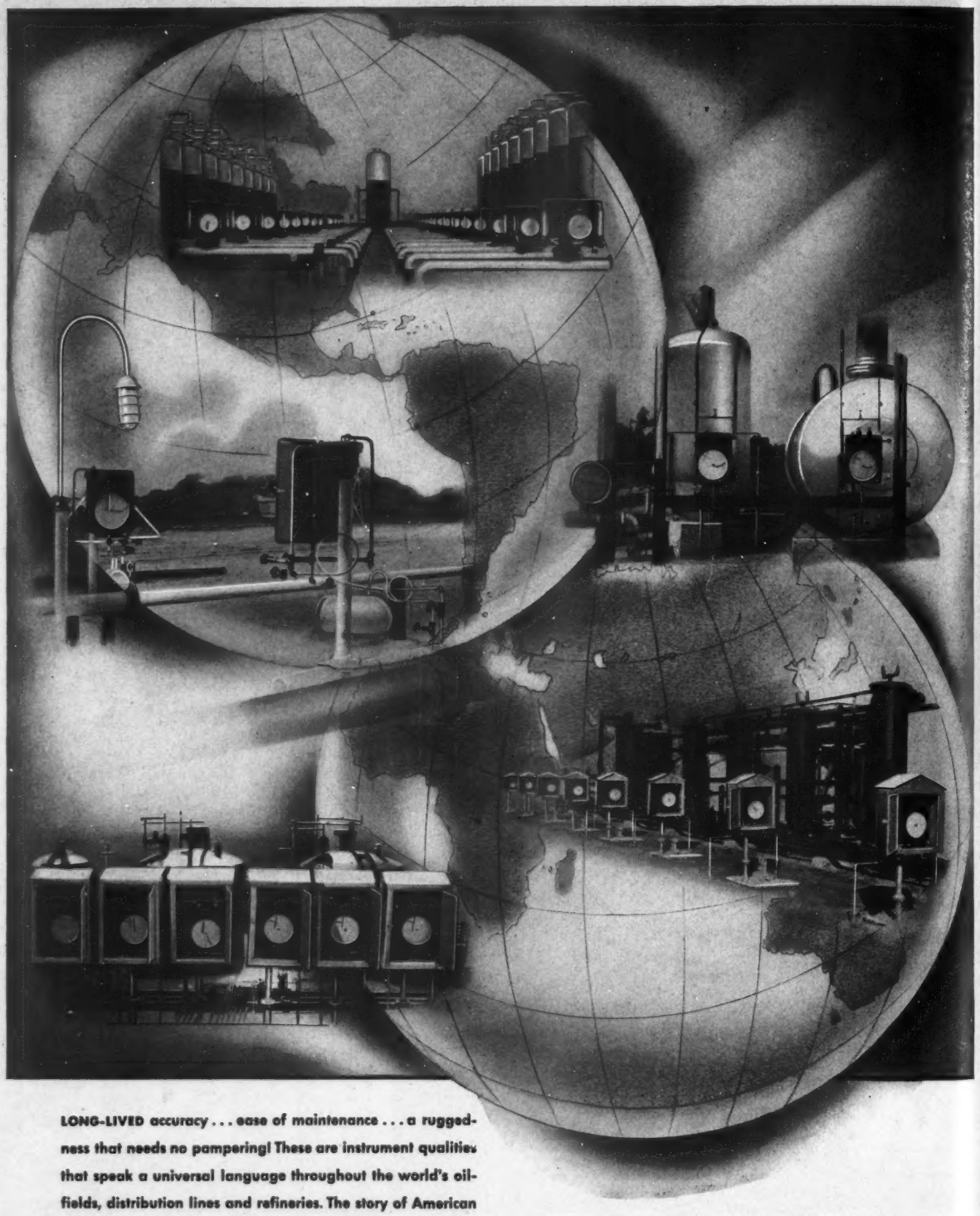


# WIRE LINE PERFORMANCE



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# AMERICAN
## *METER COMPANY*

INCORPORATED (ESTABLISHED 1836)

A976

# 11,004 FT. WITH WILSON TITAN RIG!

## Powered By 2 Wilson 350 H.P. Gas Engines

● *Detailed description of Wilson rigs can be found on pages 2272 to 2279 of The Composite Catalog and Pages P-48 to P-57 of the Drilling Equipment Directory.*

● Wilson sets another record . . . this time on the Richfield Oil Corporation deep test well, Wheeler Ridge, California, where a Wilson Titan Model Rig has already drilled to 11,004 feet, and may yet go deeper. To our knowledge, this is the deepest well ever drilled by an internal combustion powered mechanical rig.

After keeping a close contact with this particular drilling job, the manufacturers feel that the performance of the Wilson "Titan" Rig was highly satisfactory and comparable in drilling time to a steam rig, with the advantage of extremely worthwhile savings as described below.

The drilling time is illustrated by the following examples:

From 9272 feet on April 8th, hole was made, of which 25% was cored, to 10,400 feet by May 2nd, from this point and date all the hole was cored to 11,004 feet by May 18th.

Here are hole sizes, sizes and lengths of drilling strings and amounts and weights of casing strings set:

26-inch hole drilled to 1570 feet where 18⅝-inch slip joint surface casing set; 12¼-inch hole to 8562 feet with 8⅝-inch, 38-lb. casing; 8½-inch hole to 9272 feet, then 7⅞-inch hole on to bottom of 11,004 feet, then underreamed from shoe of 8⅝-inch at 8562 feet to 10,815 feet where the string of 6⅝-inch, 26-lb. casing was set and cemented. Both drilling and coring done with 5 9/16-inch, 22.2-lb. drill pipe to about 6000 feet; 4½-inch, 16-lb. drill pipe to 9000 feet; 3½-inch, 15½-lb. drill pipe to 11,004 feet.

FUEL COST LESS THAN $4.00 PER DAY . . . Rig Virtually Pays for Itself . . . It is estimated this Wilson Rig has already paid for itself thru savings in fuel, repairs, etc., as compared to use of steam equipment. The average fuel cost to drill 11,004 feet of hole amounted to less than $4.00 per day, say operators of the rig who also say that approximately $40,000 already has been saved in fuel, boiler repairs, fireman's pay, and rigging-up time. Thus the savings alone are almost equivalent to the initial cost of the rig, which means that the Wilson Titan Model Rig virtually paid for itself in the drilling of one hole, and is still capable of drilling many more!

**Wilson**

**WICHITA FALLS, TEXAS**

Export Office: 30 Rockefeller Plaza, New York, N. Y.

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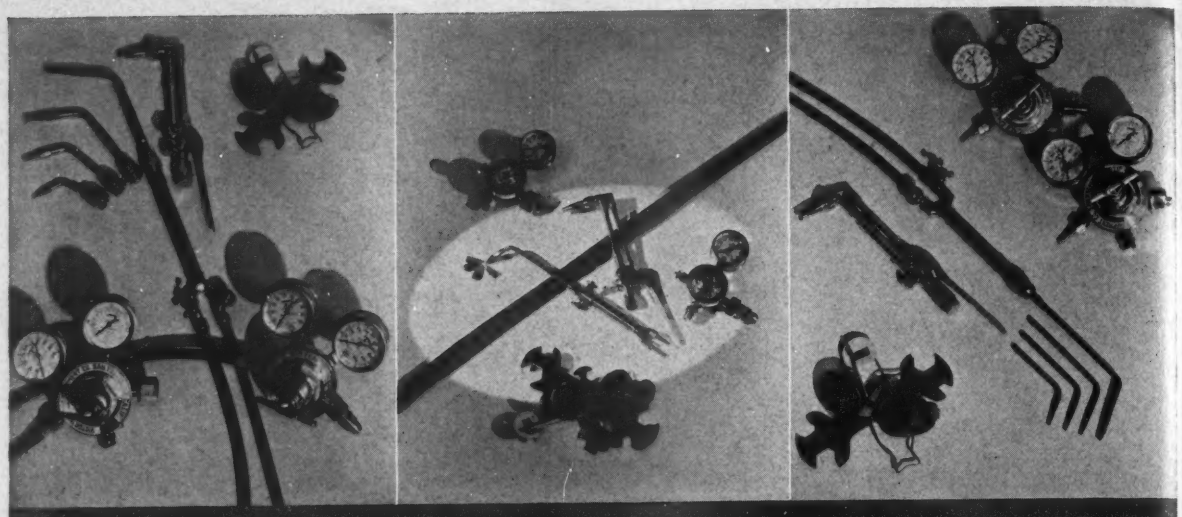

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There is no obsolescence when you operate a VICTOR Welding or Cutting Unit. No matter which outfit you may choose today, the amazing interchangeability of Nozzles and Tips allows for its ultimate extension to meet future needs or future developments. This, also, is the reason we can repair and modernize "today" VICTOR equipments we sold over two decades ago.

THERE IS NO OBSOLESCENCE WHEN YOU OWN VICTOR

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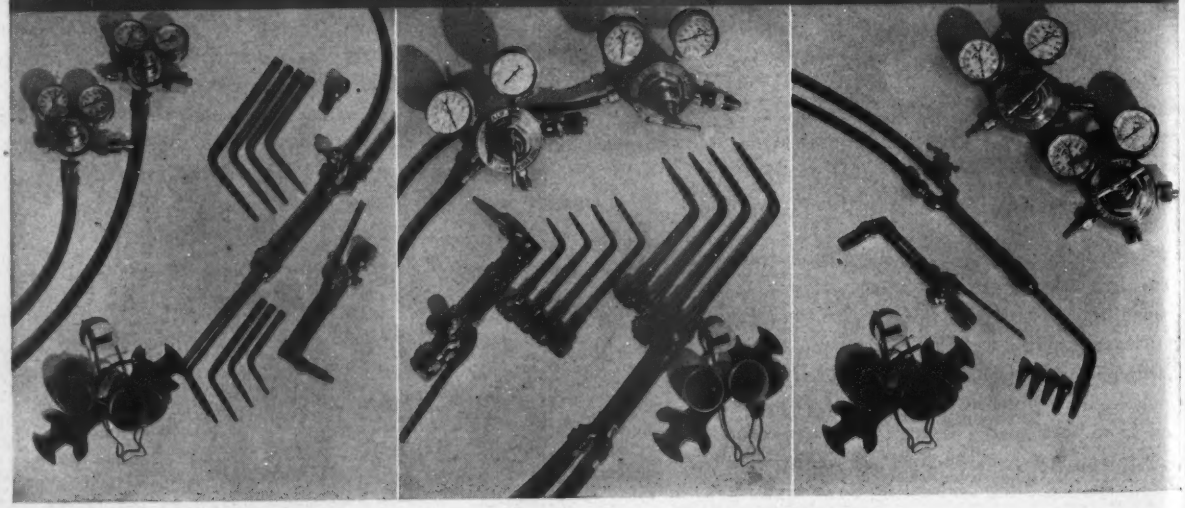

# THAT'S DOING IT!

# WICKWIRE ROPE

Every wire of a new rope is completely encased with a film of oil. The oil storage is the impregnated hemp center. The supply is sufficient to last for the life of the rope provided "washing out" and evaporation are prevented by the occasional slushing of the outside surface with grease. Should a wire rope become rust-bound through neglect, it is necessary to free the bearings of wire against wire by the use of a thin penetrating oil. A well lubricated rope operates with minimum internal friction. Hence, wire fatigue and internal wear are reduced with the natural resultant of longer wire rope life.

**WICKWIRE SPENCER STEEL COMPANY**

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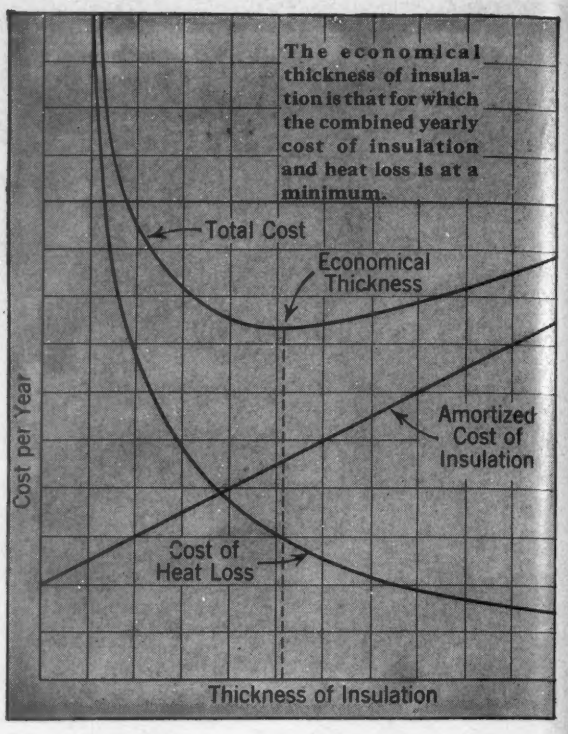
# How to SAVE THE MOST MONEY with INSULATION


The economical thickness of insulation is that for which the combined yearly cost of insulation and heat loss is at a minimum.
Total Cost
Economical Thickness
Amortized Cost of Insulation
Cost of Heat Loss
Cost per Year
Thickness of Insulation

**Make sure all your equipment is insulated with the *correct materials* in the *one correct thickness* that combines maximum operation efficiency with minimum heat waste**

WHETHER or not your insulation is a paying investment depends entirely on the materials used and the amount applied. *Too much* will never pay an adequate return . . . *too little* results in heat losses that build up excessive fuel bills. But proper insulation, properly applied, will avoid both these costly mistakes. And a J-M Engineer will be glad to work out the most economical application.

Let him go through your plant and make a thorough study of your requirements. He'll give you the benefits of all the knowledge and data that Johns-Manville has accumulated during 81 years of research and practical experience on insulation problems. He can show you—from the complete line of J-M Insulations in brick, block and pipe-covering form—what materials are best suited for all your equipment. He can tell exactly how much insulation you can profitably use, and his recommendations will point the way to worth-while reductions in your fuel costs.

J-M Insulation Engineers have saved many individual plants thousands of dollars a year. There's a good chance they can do the same for you. For full details on J-M's free Engineering Service and on J-M Insulating Materials, simply write Johns-Manville, 22 East 40th Street, New York City.

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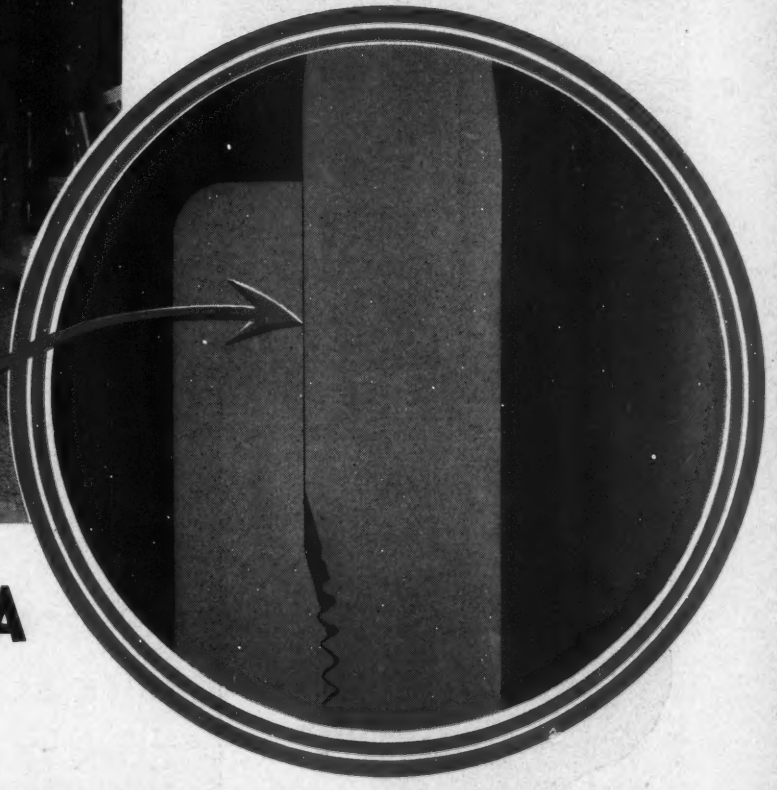
**INDUSTRIAL INSULATIONS**

For every temperature . . .
For every service condition

**Reduce Your Fuel Costs in 1939**

# SAFETY ASSURANCE WITH REED SHRINK GRIP TOOL JOINTS



## THE SAFETY AREA

***AN ADDED SUPPORT FOR GREATER SAFETY***

## SHRUNK ONTO THE DRILL PIPE

***TO PREVENT FAILURE AT THE LAST ENGAGED THREAD***

## REED ROLLER BIT CO.

**ROCKY MOUNTAIN, MID-CONTINENT AND GULF COAST DISTRIBUTORS FOR MARTIN-DECKER PRODUCTS**

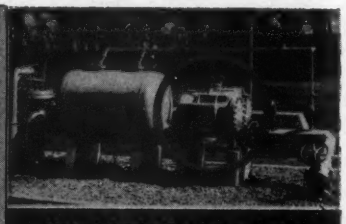
# for EVERY branch OF PETROLEUM SERVICE

Two-inch Model X-71 Brodie Meter on oil well at Long Beach, Calif.

The use of Brodie Meters offers many advantages. Among these are isolation and elimination of leakage and other unnecessary losses. Big savings in handling time all along the line are equally important. In the production end of the industry Brodie Meters curtail weatherage, solve tankage problems, and help synchronize pump or flow rates to meet the daily allowable. The performance of Brodie Meters is highly accurate and fully reliable. They can be depended upon fully for many years of service and they require but little service themselves.

**OILFIELD SERVICE**

Metering is valuable in equalizing production through each tower to equal allowable. It increases frequency of deliveries to pipeline. It decreases weatherage. It indicates, to some extent, conditions at the producing strata.



Six-inch Brodie Meter on gathering system.

Model X-71

OIL WELLS
PIPELINES
REFINERIES
WHARVES
BULK PLANTS
TANK TRUCKS

**for handling**

**CRUDE**

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**FINISHED PRODUCTS**

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**LIQUEFIED GAS (butane)**

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One 4" and three 6" Brodie Meters in this installation decrease weatherage and tankage problems.

# BRODIE METERS

**Representing**

THE BASTIAN - BLESSING COMPANY

THE BROWN INSTRUMENT COMPANY

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WM. B. SCAIFE & SONS COMPANY

**PARAMOUNT MANUFACTURING COMPANY**

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# *Practical and* DEPENDABLE

THE BAKER LINE OF OIL TOOLS has been universally accepted by oil men because their design, construction and operation have always demonstrated a practical knowledge and clear understanding, on the part of their makers, of actual well conditions and operating requirements.

This widespread acceptance is more fully understood when it is realized that literally day and night—year after year—the Baker organization actually has been a part of the constantly changing drilling and production panorama. It has watched the rotary method replace cable tools in most fields. It has worked side by side with crews to solve the countless new problems arising with the increase in well depth from 2,000 to 15,000 feet. In short, it has followed step by step the ever changing trends and needs of the Petroleum Industry.

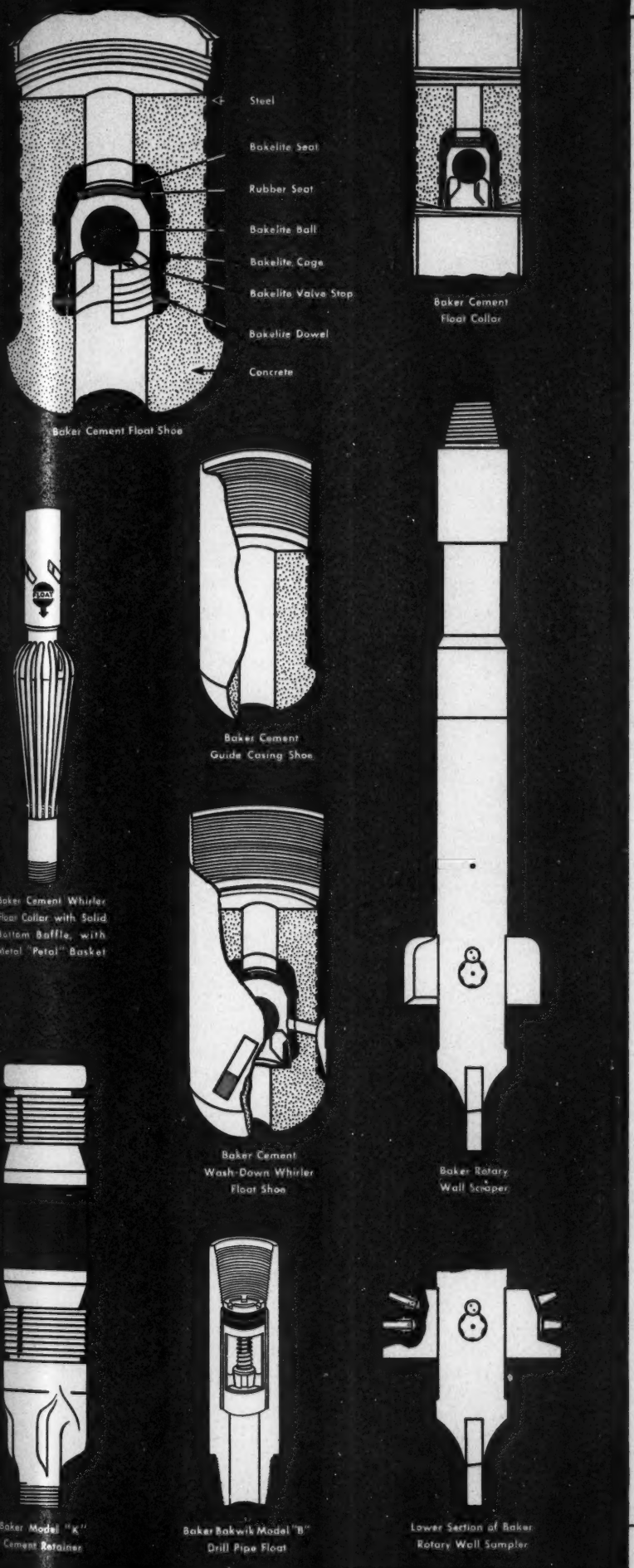
Oil men have approved and appreciated the eagerness of the Baker organization to adopt new or improved materials such as various alloys, Bakelite and cement—and the ability to use them skillfully to make "better tools that will do a better job."

Based upon this background of experience, Baker oil tools for the year 1939 will continue to measure up to every expectation, whether used by the operator who can telephone for delivery within the hour, or on a well in the jungle where tools are months in transit and *must not fail* to do *even more* than has been claimed for them. Today as for the past thirty-one years every tool or device that bears the name "Baker" is a "working" example of the familiar Baker slogan —"Practical and Dependable."

**BAKER OIL TOOLS, INC.**

HUNTINGTON PARK, CALIFORNIA

HOUSTON, TEXAS

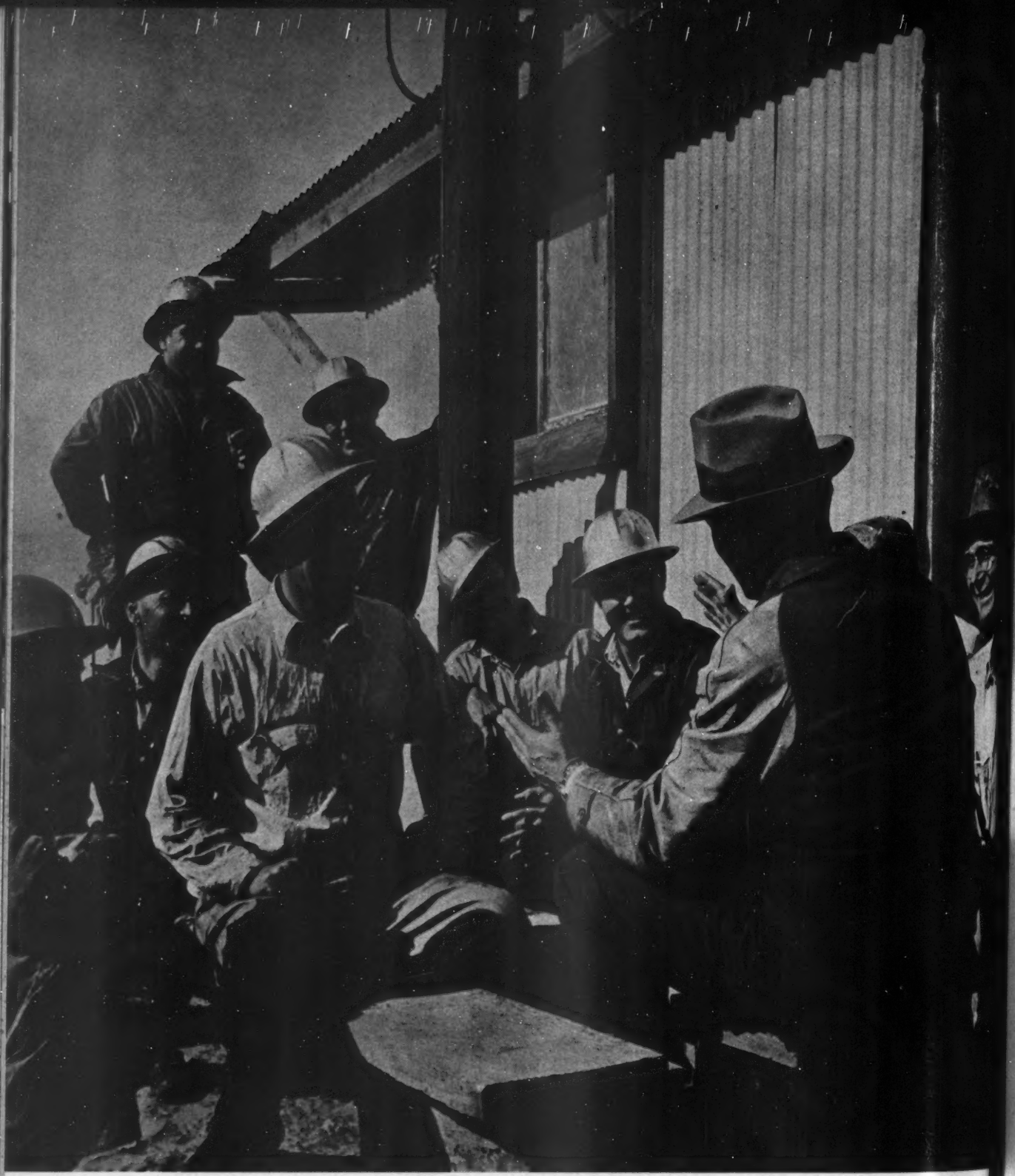

Steel
Bakelite Seat
Rubber Seat
Bakelite Ball
Bakelite Cage
Bakelite Valve Stop
Bakelite Dowel
Concrete
Baker Cement Float Shoe
Baker Cement Float Collar
Baker Cement Guide Casing Shoe
Baker Cement Whirler Float Collar with Solid Bottom Baffle, with Metal "Petal" Basket
Baker Cement Wash-Down Whirler Float Shoe
Baker Rotary Wall Scraper
Baker Model "K" Cement Retainer
Baker Bakwik Model "B" Drill Pipe Float
Lower Section of Baker Rotary Well Sampler

# Complete

DETAILS as to the construction, operation and application of the most widely used Baker oil tools are available in the form of BAKER BROADCASTS.

The Baker Rotary Wall Scraper Broadcast is No. 19; the Baker Cement Retainer is covered in detail in Broadcast No. 17-A; MODERN CEMENTING PRACTICES are described and illustrated in Broadcast No. 18. Any or all of these Broadcasts are sent promptly to any oil man upon request. The complete line of Baker Oil Tools is described in

your current Composite Catalog, as well as in the individual Baker Catalog, also available upon request. Operators desiring additional or specific information are requested to address Baker Oil Tools, Inc., Box 71, Huntington Park, California, U. S. A.



MEMBERS OF THE STANDARD OIL FAMILY grin broadly at the tall fishing tale their superintendent spins. From the looks on their faces, one will get you three that the fish got away.

# SIXTY YEARS OF FAMILY LIFE

## A Story of

## STANDARD OIL COMPANY OF CALIFORNIA

By EUGENE I. HARRINGTON

### CHAPTER I.

### The Men of the Family

IT IS FEBRUARY, nineteen hundred and thirty-nine. In Miami, Florida, the President places a firm forefinger on a golden key and officially opens America's newest insular possession, Treasure Island on San Francisco Bay. There, television makes its commercial bow to the nation: The petroleum companies of California, in an impressive exhibit, dramatically tell the story of their industry: From the Press Building, thousands of words flash out over the wires about the nudes of Botticelli and Sally Rand.

In Washington, the Congress continues its drive for economy in government: The new Secretary of Commerce vigorously holds forth for the right of business to make an honest dollar: And the country regretfully learns of the retirement from the Supreme Court of a sharp-eyed, attentive old man named Louis Dembitz Brandeis.

Across the Atlantic, a new war-rash breaks out over Europe: Foreign correspondents call the turn on another squeeze play by the dictatorships: And the deep-toned knell of the eleven-ton Campanone of St. Peters sadly signals the passing of a great and kindly little man, Pius XI, Pope of Peace.

On still another continent, prudent, democratic King Ibn Sa'ud of Saudi Arabia orders the installation of running water and electric lights in Mecca: The ultra-modern city of Dammam, on the shores of the Persian Gulf, continues to grow rapidly and fascinated Arabs hear their first radio program and see their first motion picture: While out on the sun-scorched desert to the north, Arabian and American employees of the California Arabian Standard Oil Company work side-by-side laying a 43-mile pipe line from the proven oil field of Dammam Dome to the Standard-built port of Ras Tanura.

And in 1939, people around the world turn from the turbulent present to celebrate events that occurred in other years. In Great Britain, millions of loyal subjects sing "God Save the King" on the birthday of their ruler. In America, citizens joyously dance at hundreds of Presidential Birthday Balls: And all over the Western Hemisphere, on the Islands of the Pacific, in Europe, in Asia and almost every place where men seek and sell oil, eighteen thousand workers pause sometime during the year to wish many happy returns to an old friend—the great world-spanning Standard Oil Company of California from whose sixty-year-old roots their Family tree has grown.

### Oil in Their Blood

HIGH UP in a gray granite building at the corner of Bush and Sansome Streets in San Francisco, a clock strikes eleven. Ten men rise from their desks in various offices around the 18th floor and move briskly through corridors to a big, wood-paneled room. Inside, they seat themselves around a large table and, after a short exchange of greetings, another directors meeting of the Standard Oil Company of California is under way.

That scene takes place every workday of the week except Wednesdays, at the same time and in the same place. But there is something different about the men in that room, about the things they have in common and the way they tackle their work.

Each of those ten directors is a full-time Standard Oil employee; each is a working oilman who has climb-

THE FAMOUS LITTLE STAR NO. 4, in Pico Canyon, California, which D. G. Scofield and Alex Mentry drilled to a depth of some 600 feet nearly sixty years ago. This pioneer California oil well has produced steadily since it was first sunk into the rugged Southern California mountainside, back in 1879.

ed slowly from the ranks. Between them, they have worked 313 years for their company—an average of 31 years per man.

Those men share responsibilities common to most corporation executives. They must see to it that the company whose course they steer makes enough money to pay its more than 18,000 employees their aggregate yearly wage of over 39 million dollars. They must meet an annual tax-bill of more than $42,000,000. They must find ways and means of providing a margin of dividends for over 71,000 stockholders. And all those things must come from oil; for oil is the business of Standard of California.

Year-in and year-out, the directors have done their jobs well. For in all the corporate history of this company, it has never missed a payroll, defaulted on a tax-bill or passed a dividend.

If you were to ask any of those ten men who meet together on 200 business mornings a year how they had managed all this, you would in all probability get an answer something like this:

"Thanks for the compliment but before you can accomplish those things, you must first produce, refine and distribute petroleum and its products economically and efficiently. That's no ten-man job; it's something the whole Standard Oil Family has to tackle together. And it's only because every one of the employees of this company has pitched in and done his share that Standard has always been able to meet its obligations."

Any one of the directors might truthfully add that he and his fellow-members on the Board consider this "Family Spirit" a distinctly valuable asset. But if you know your Standard Oil you also know that it isn't listed on the company's books or balance sheets and that neither these men nor the directors who preceded them take credit for preserving it.

Yet that "Spirit" didn't spring from barren soil. Its seeds were planted by D. G. Scofield, in the earliest days of the company. It grew under the watchful tending of Colonel Rheem, who followed Mr. Scofield to the Standard Oil presidency. It came to full flower under the solicitous care of Kenneth R. Kingsbury,

who headed the company for 18 years. Thus, it has always been a live company policy—nourished and guarded and brought to fruition just as surely as any oil well, refinery or pipe line listed on the asset side of the Standard Oil ledger.

Knowing that about Standard of California, you begin to understand the broad policies that govern the relationship between this company and its eighteen thousand or more employees. It becomes increasingly apparent that a set of hard-and-fast rules haven't been drawn from a stack of text-books and reports, by a group of theorists gathered around a highly-polished mahogany table.

Instead, these working oilmen must have looked behind the scenes into the lives of the men in the ranks —Joe Jacobus, Wasco driller; Jim Brady, tank-truck salesman in the Willamette Valley; and Bill Bronson, boiler-house foreman at El Segundo. They must have been thinking, not coldly and impersonally about an army of 18,000 unidentified people, but about Joe and Jim and Bill, three members of the Standard Oil Family, who might some time be hurt, take sick or leave Mrs. Joe and Mrs. Jim and Mrs. Bill without any means of support. Finally, the way those policies have worked in practice is proof positive that they could only have been born of an intimate knowledge of the human problems individuals face and the singular fact that all of those directors were once the Joes and Jims of Standard Oil.

And that brings you face-to-face with the realization that the story of the Standard Oil Company of California cannot be fully told in the ordinary terms of earnings, surplus, and profit and loss. It must also be told in terms of men and of incidents in which men figure. They are part and parcel of the Standard Oil pattern; they give form and shape to the whole design.

To understand the complete story of Standard of California—of its growth, its uninterrupted progress and its continued leadership—you must first understand the relationship that exists between this company and its employees. It is a basic characteristic; it runs, like an identifying thread, through the entire 60-year history of the organization. Therefore, before beginning that history, California Oil World proposes to take a quick look at some of those men and to tell briefly a few of the stories in which they have figured.

SAFETY WAS OF LITTLE CONCERN to the drilling crews of an earlier day. This photograph of a typical pipe-smoking cable crew on an oil-soaked wooden-rig was taken in the Maricopa field in 1908, long before the devices and practices of this safe-and-sane age were even considered.

WHEN THIS SHINY STANDARD TRUCK climbed 24-Hill in 1910 with its first load of hay an old mule-skinner jeeringly remarked: "Put another straw on that fancy gas-buggy and we'll have to haul 'er up by team."

### The Family

JACK CANEVARI rubbed the sleep from his eyes as the impatient clamoring of a telephone bell suddenly disturbed his Sunday morning slumber. He fumbled his way toward the hall, lifted the receiver from its hook and called a dull "hello" into the phone.

The answering voice brought Jack quickly to attention. It was the long-distance operator saying, "Is this Mr. Canevari, South San Francisco branch manager of Standard Oil?" To Jack's affirmative reply, she answered, "One moment please. San Jose is calling." After a moment's wait, there was another voice on the line saying:

"Jack, this is Gillespie, assistant District Manager at San Jose. I'm sorry to disturb you so early in the morning but a very unfortunate thing happened late last night. A young fellow who used to work for me in a Standard Oil branch up in Oregon was hurt in an automobile accident on the Bayshore Highway. They just phoned me from the South San Francisco Hospital to say that he wanted me notified.

"This young man's name is Bill Singer and he's on vacation, a long way from home. I've wired his folks but they can't get down here for at least a day. In the meantime, I wish you'd run over to the hospital and see that he is being properly taken care of. Make sure that he doesn't want for anything and gets the best possible medical attention.

"I hate to disturb your plans on a nice summer day like this but I can't get up there for a while yet and I want to be sure Bill's in good hands. And say, Jack, would you do one other little favor for me? See if you can get some flowers and send them over to Singer's room; a hospital is a pretty dreary place at best and maybe a few posies will help cheer Bill up until his mother and dad can get there."

Jack Canevari spent most of that warm July day in 1938 at the bedside of a man he'd never met nor heard of before; and during the long recovery period, he made a point of dropping in on him every so often. For from their first meeting, Jack and Bill were far from strangers; they were, in fact, members of the same Standard Oil Family and no more need be said.

### Behind the Scenes

The Standard Oil Company of California has a neatly printed little booklet with "S.O.E. Benefits" inscribed on its blue cover. In brief and simple terms, it tells exactly what a Standard employee may expect from his company.

In black type, those policies are just so many cold words. Yet actually they are much more than that, for they have touched the lives of thousands of men and women. Behind each one there are dozens of warm human stories that explain why those policies were adopted and what they have meant to Standard Oilers and their families.

Just as the Standard Oil directors must have done when they formulated these policies, California Oil World has also looked behind the scenes into the lives of the men in the ranks. And it is our purpose to reveal, in the form of a few case histories, exactly what we have seen.

**The little blue book mentions sick benefits . . .**

MARCUS EDWARDS had worked in the Standard Oil Company's El Segundo Refinery as a barrel filler, box-maker and stockman for 19 years. Then, at 54 years of age, he became ill with arthritis, so crippled he could scarcely walk. His doctor had advised him to spend 6 to 8 months on the desert; George Simkins, Foreman of the Personnel Department at the refinery, had come over to the house to tell him that under Standard's sickness plan he could take 6 months sick leave on full pay.

In December, 1937, Marcus Edwards went to live on the desert. Six months passed slowly by; his condition had improved but he was still unable to return to work. Another Standard Oil man called to suggest that he had two weeks vacation still coming.

Finally, the doctor told him he had recovered sufficiently to do a little light work. He had a talk with Harry Hanna, El Segundo Refinery Manager and Ced Moorhead, Superintendent. They'd told him there was a job available at the plant that wouldn't require much physical effort and he could go back to work and still follow the doctor's orders.

IN 1910, most of the houses in Taft looked like the one pictured above. In front of it are shown Mr. and Mrs. J. V. Stuck, with their horse and dog. John Stuck was a Standard Oiler then and he is a Standard Oiler now—drilling foreman with headquarters at Standard of California's modern camp in the up-to-date city of Taft.

Marcus Edwards is a new man today; he's getting around fine, he's on the job every day and he has a happy outlook on life.

*

BILL BUGMAN is 63 years old and he is a pipefitter at Standard Oil's Richmond Refinery. Some

PRODUCTION GANG at the Standard's Jamison lease camp in the Midway in 1909. That was just before this famous field became one of California's great producers; in 1909 the combined production of the Midway-Sunset reached a total of something over 4,000,000 barrels of crude.

NOTE THE HANDLEBAR MUSTACHES on two of the Standard's blacksmiths, shown in front of the company's first blacksmith shop on 24-Hill in the Midway, back in 1910. The men from left to right are Ed Cronk, an unnamed visitor from the Honolulu Lease, Henry Neidecker, Charles Rickenheimer and R. U. Reed.

months ago he took sick and was unable to continue on the job. He talked to the company doctor about his condition and, as he puts it, "They figured up my sick benefits and told me to stay put until I was well. I got the best doctors around here to look after me and in a month or so I was completely cured." Bill Bugman is back at his old job now, rounding out his 25th year of service with the company. In another two years, he will be retired on full annuity.

*

UNTIL 1936, "Bud" Damon, Standard Oil machinist, had hardly been sick a day in his life. Somehow, he contracted Hodgkins disease, a rare and serious form of anemia. He was sick for a long time; for 6 months his regular pay check was sent over to his wife every two weeks.

Finally, the progress of the disease was arrested and "Bud" was able to work for short periods; the company was able to find jobs around the plant that he could do without too much effort. For a year or more, Damon could only work for a little while at a time but gradually he regained his full health.

Now Bud's back on his regular job again. He suffered a good deal physically but his company saved him from many mental worries.

*

TO A HEALTHY fellow like Bill Driscoll, a little thing like an ankle infection wasn't worth bothering about. He kept on working at the lead-burning job he'd had at the Standard Oil Company's Richmond Refinery for eleven years. But the infection spread, the bone became affected and his doctor ordered amputation.

That happened in 1932 but Bill remembers it as though it were yesterday. He told the California Oil World: "There wasn't any use kidding myself; because I'd been careless I was about to lose my leg and, I figured, my job as well. Fred Martin, Personnel man at the Refinery, came over to see me and said: 'Stop worrying, Bill, and do what the doctor says. Your sick benefits will see you through. I'll have a talk with Francis Smith (who is Refinery Manager) and we'll see if we can't find another job for you. While you're laid up, your salary check will be mailed home to your wife. So set your mind at rest and go to the hospital and get it over with.'

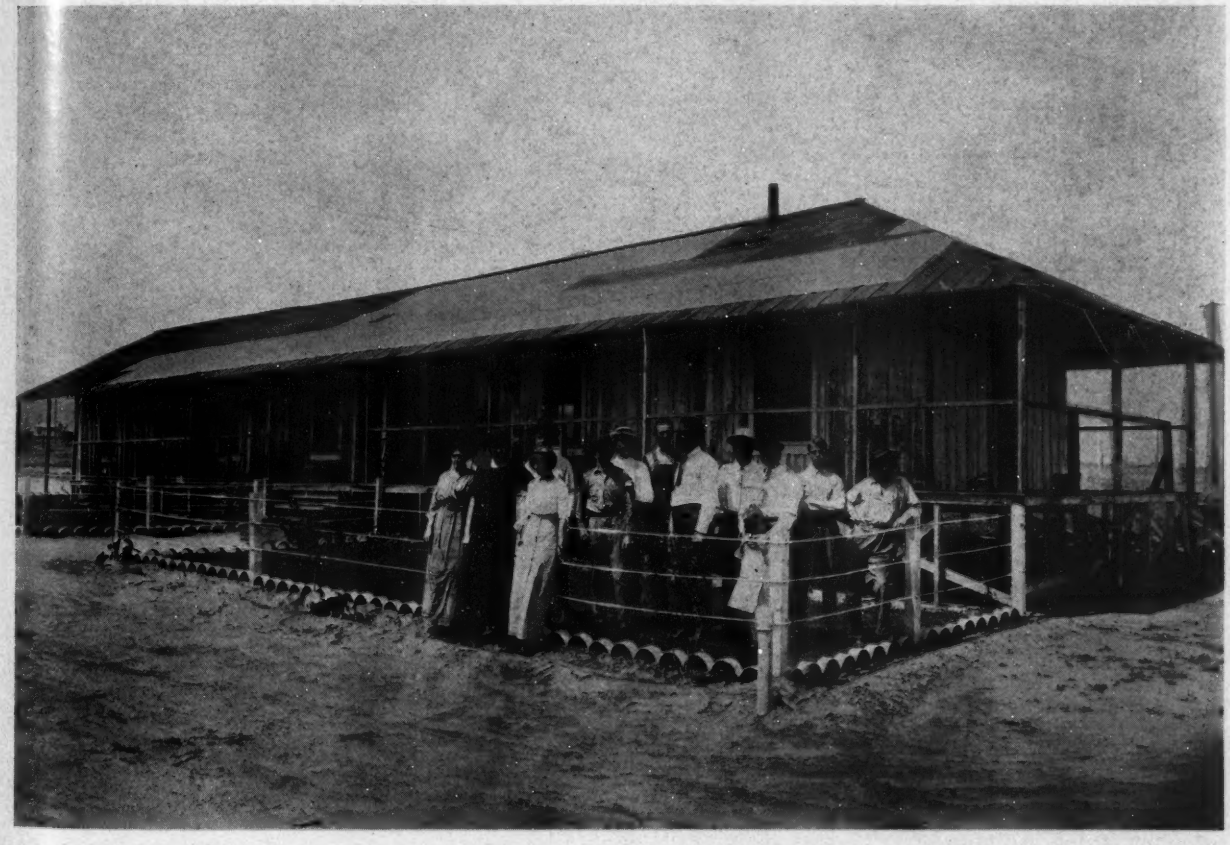
"A couple of days later, Francis Smith and Fred Martin came to the hospital to see me. And, boy, did they have good news? They told me there was a job in the tool house for me when I was well enough to get back to work. My salary kept coming the whole time I was laid up. Naturally, I think Standard's the greatest outfit in the world to work for; after all, it was depression and I was just one of thousands of employees. But from the way they treated me, you'd have thought I was the head man."

*

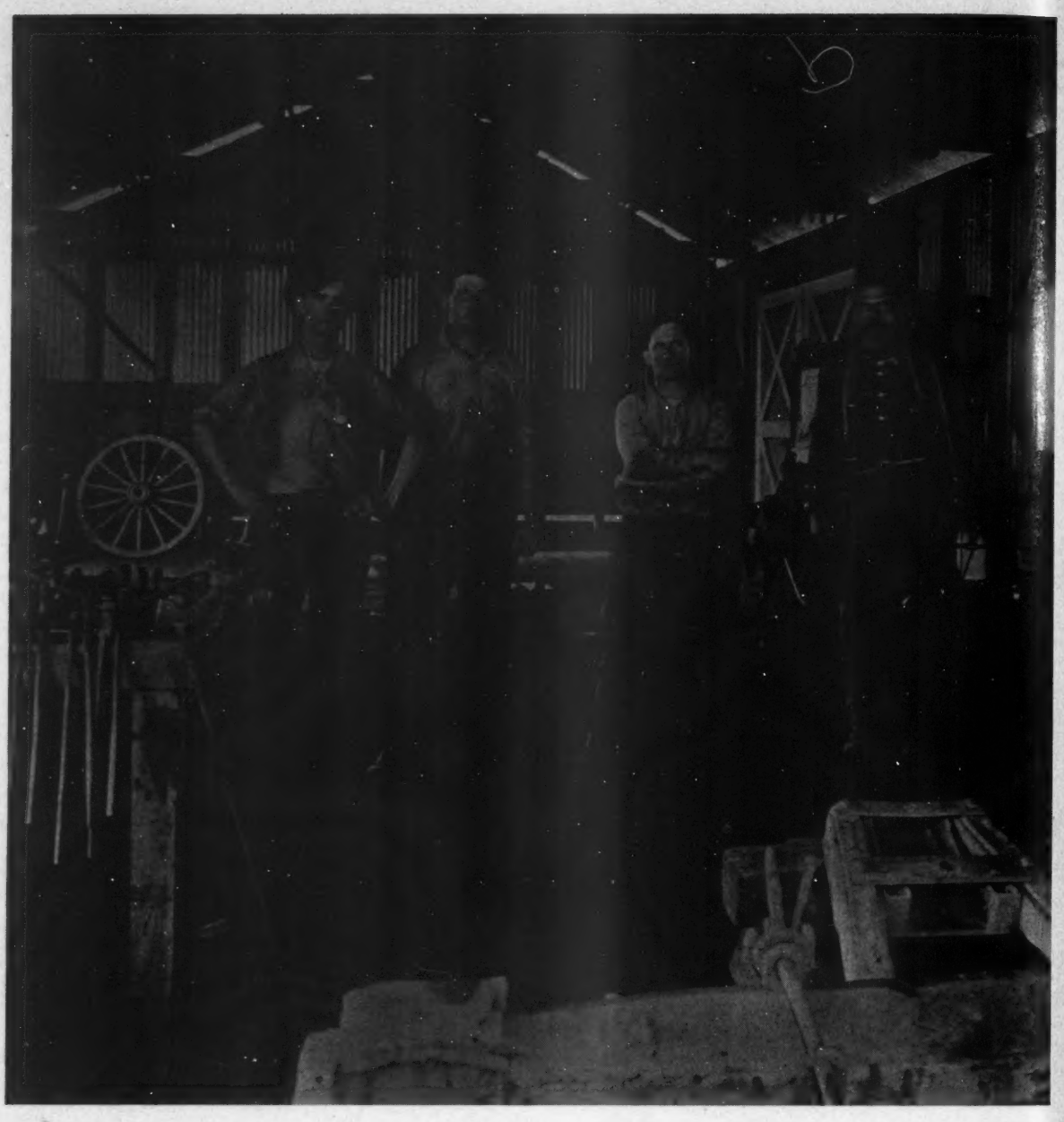
HUNDREDS of other stories like these could be told because they are happening every day. To fully realize that, you need only know that in 1938 at Standard Oil's El Segundo Refinery full sick benefits were paid in 996 cases. A total of 4,526 working days were lost on account of illness in these cases, yet not one of those 996 Standard Oilers was docked a single day's pay.

*

SEVERAL YEARS ago, plans for the construction of a refinery on Bahrein Island were announced and



SHARP-EYED STANDARD OILERS, scanning this group posed in front of the combination cook-house, dining room and bunk-house on Section 18 in the Midway in 1914 can pick out Earl Delaney, Production Superintendent of the Northern District, Henry Cartney, Standard of Texas employee, Bill Brandt, Southern District driller and Charley Sitzman, retired Standard Oiler. Note the fenced-in lawn, which was a rarity in those days and the special pride of this camp.



THIS WAS THE LAST WORD IN BLACKSMITH SHOPS in 1911. The Standard Oilers who ran this wagon and shoe shop in Section 14 in the Midway are, left to right, Bob Pyles, Curly Reed, Ed Cronk and Ira Moon.

good jobs were suddenly opened up in producing, refining, and pipe line work. But instead of seeking men in other companies with experience in the tropics, Standard combed its own ranks for men who had earned advancement. They found them—at El Segundo and Richmond—in the West Side and Los Angeles Basin fields; in pumping stations, marine terminals and on tankers. Then the company built modern air-conditioned communities in the near East where these men and their families could live comfortably. This was just another instance of the Standard of California policy of filling its better positions with men from its own ranks and providing for their welfare and comfort.

**The booklet speaks of retirement . . .**

ACROSS THE bay from San Francisco George Lowell is really enjoying life. He owns his home, has two girls in college and a boy in high school. If he wants to visit Treasure Island on a Wednesday or take a trip to Los Angeles, all George has to do is pack a bag and go.

Yet George Lowell didn't inherit a fortune or win the Irish Sweepstakes. He simply worked continuously for one company for 34 years, saved some money, and bought his home. When Mr. Lowell reached the 65-

year retirement age, his employer, Standard Oil of California, said, in effect:

"George, you've worked hard most of your life and it's time you took things easy. You started with us as a telegraph operator at a San Joaquin Valley pump station in 1902 at a salary of $60 a month and board. You've come up through the ranks to a better job at a higher salary. We appreciate your service and loyalty and we're going to reward it by paying you a good part of the average salary you earned while you were with us as an annuity. We'll send you the annuity check every month and we hope it will be for a long time to come."

So George Lowell lives comfortably in his attractive home and doesn't worry about a thing in the world.

*

ON THE CORNER of Sonoma and Colusa Avenue, in Berkeley, there is a big yellow frame house, surrounded by a spacious garden. In front, stands a shiny sedan. The pink slip for the car and the deed for the house and lot rest in the safe-deposit box of a keen-eyed white-haired, retired Standard Oiler named Harry Forsberg.

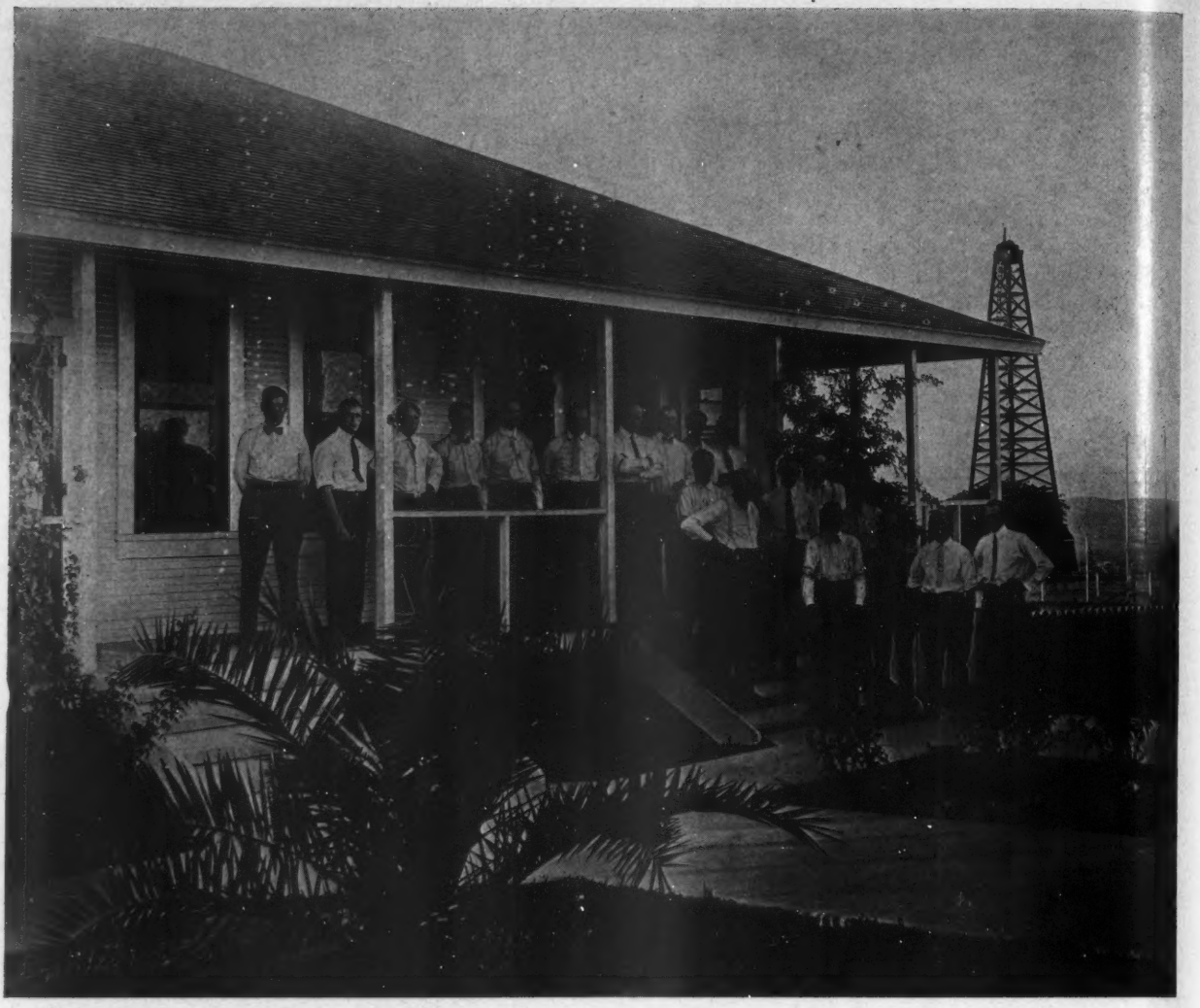
If you were to ask Mr. Forsberg how he had managed to buy such a fine looking car he would answer with a twinkle in his eye:

"I didn't buy that car—it was bought for me by the Standard Oil Company, and entirely for pleasure. Not only that, but they pay for every drop of gasoline that goes into it; they pay the taxes on this house, for the food we eat and all the expenses of every trip my wife and I take."

When you look astonished at such generosity, Harry Forsberg quickly adds:

"That's what comes from working for a company like the Standard. That's the reward they give for loyalty and service. I don't mean that they specifically give a car and a fine home. But they pay you well while

HORSE-DRAWN GASOLINE TANK WAGONS were a common sight on San Francisco streets not so very many years ago. A round-trip from Standards' warehouse to Sutro Baths, on the Beach, took nearly a whole day; now the company's streamlined trucks make the trip in little more than an hour.



THE STANDARD'S FIELD STAFF OF 1914, all dressed up and posing in front of the Section 14 office, at Taft in the Midway. Seven of these men are still active Standard Oilers, a number of others have retired on Standard annuities. Left to Right) Back row: Homer Kidwell, Alec Newton, W. N. Thompson, Homer (Pat) Dailey, E. M. Delaney, J. V. Stuck, L. B. Graff, Joe Johnson, Jim Scott, W. I. McLaughlin and Jack St. Clair. Front Row: C. A. Dailey, Cap Newton, L. B. Little, L. A. McCall, L. J. Green, Frank Hall, Joe Hovis, Ed Cole and J. C. Reynolds.

you're working for them, advance you every chance they get and when you are 65 years old they retire you on a life annuity.

"Take my own case," Mr. Forsberg says. "I went to work for one of the Eastern Standard Oil Companies in 1894—as a pipe line walker at $60 a month. I worked hard and ten years later, I was transferred to the California company as Assistant Superintendent of the new Bakersfield Pipe Line. When I retired a little over 5 years ago, after 40 years of service, I was General Superintendent of Pipe Lines at a great deal more than $2 a day.

"Nowadays, I have no worries," Mr. Forsberg adds, "thanks to my salary all these years and the Standard Oil annuity check I receive every month. That buys our gasoline, pays our taxes, food, and clothing bills and any other expenses we have. And I'm no exception, believe me.

"There are hundreds of us fellows around the country and we all have the same feeling. Some of us became executives, others didn't, but we are all members of the same family. We were well paid while we worked and have an annuity for life when we retired."

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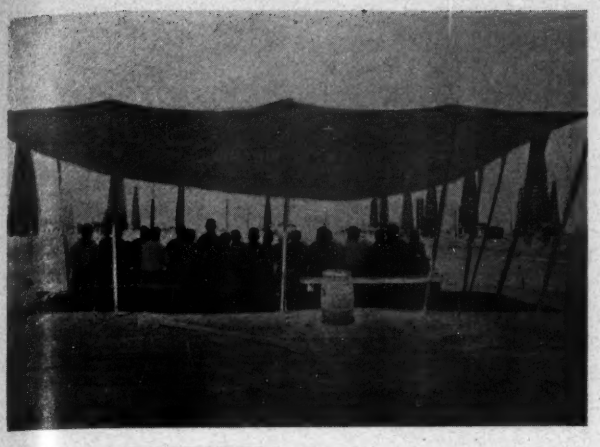
THERE ARE other policies the little blue booklet mentions; there are the special annuities for men and women who retire before they reach the age limit; there are the life insurance benefits, the vacations that are provided, the safe working conditions and the free medical examinations. Behind each of those separate policies are innumerable stories of how they have benefited Standard Oil employees around the world. But even in a story of this breadth, we cannot relate them



STANDARD'S PIPE-LINERS rigged up dining rooms like the one above as a protection from the blistering summer heat of the San Joaquin. In 1922, the hot dusty roads of the valley were no pleasure to travel and Standard Oilers rarely went into town for lunch.

all. We can only repeat what we have heard from a Standard Oil driller in the Midway Sunset, a salesman in Sacramento, an oil dispatcher at Wait Station, a carpenter at El Segundo, and dozens of other active and retired Standard Oilers. All of their expressions of loyalty are summed up in the unaffected statement that Daniel J. Hahn, retired tankage superintendent, made just the other day when he told the California Oil World:

"I worked for the Standard Oil Company for 51 years. They were always fair with me and always straight; they paid me what I was worth and they gave me rewards when I'd earned them. They gave me security and they treated me like a human being. And when I was 65 they fixed things so I'd be comfortable for the rest of my life. So if I had my life to live over, I'd ask for nothing more, as a worker, than to be a member of the Standard Oil Family."

And perhaps what Dan Hahn expressed, explains what eighteen thousand men and women know as Standard Oil Spirit; and why, even in a period of unrest and industrial upheaval, that Spirit has remained the dominant characteristic of a very great company indeed.

### In the Final Analysis

The sixty year story of Standard Oil of California is many-sided; if it is to be entirely told it must deal, not alone with the relationship that exists between the members of the Standard Oil Family, but with the production and transportation of crude oil, the manufacture and distribution of petroleum products and the intricate matters of financially successful management.

Certainly the record of the Standard Oil Company is a long and superlative story of success.

Look, for a moment, at the record for 1938; it tells its own story of the Standard Oil Company. Thirty-nine-hundred and fifty-four Standard wells in California, Texas, New Mexico and the Rocky Mountain area produced 44,770,474 barrels of crude oil, even under sharp curtailment. In 12 states, the company leased, owned or held under permit a total of 1,941,119 acres of developed and undeveloped lands. Wholly-owned subsidiaries were active on foreign soil and owned in fee, or held under contract, or had exploration permits on over 6 million additional acres of land. In Saudi Arabia, on Bahrein Island, in Java, Sumatra and Venezuela, the company had a 50 per cent interest in 107,000,000 acres of contracted land. In other countries around the world, Standard Oil production men were conducting geological tests in a never-ending search for new petroleum reserves.

To its 3 California refineries were run a daily average of 135,703 barrels of crude oil; something over 500 different products were manufactured at these modern plants; research men were conducting exhaustive tests to discover still other uses for petroleum. On Bahrein Island, in the Persian Gulf, the fifty-percent-Standard-owned Bahrein Petroleum Company produced 8,297,998 barrels of crude, ran a daily average of 23,139 barrels of petroleum to the stills of the modern refinery on the island and showed an estimated net profit for the year of $3,400,000.

Through Standard Oil Company's network of pipe lines and on its fleet of 24 ocean-going tankers and 15 other craft, more than 143,000,000 barrels of gasoline, crude and fuel oil were transported.

A CRACK DRILLING CREW of the vintage of 1908 on the Standard's Jamison lease, in the Midway-Sunset, near Moron, which is now Taft. The big fellow with the handsome mustache and flowing head of hair, second from the left is Earl Delaney, now Production Superintendent of the Northern District; on his right is W. H. Holcomb, driller; on his left are A. J. Hardenhoff, tool dresser and Shanty McGown, driller.

IMAGINE BUMPING OVER THE RUTTED ROADS of the San Joaquin Valley on the solid iron wheels shown on the Standard truck above. Yet in 1917, when this picture was taken, smooth concrete highways were a rarity and rubber tired trucks were the exception in the oil fields of California.

In marketing, the California company made rapid strides. Total domestic sales of all major products for 1938 passed the $136,000,000 mark. The modern string of super-service stations displaying the red, white and blue chevron of Standard Stations, Inc., sold $41,611,932 worth of petroleum products, tires, batteries, accessories and service to a motoring public that has dubbed these stream-lined, neon-lighted temples of trade "America's Favorite Service Station System."

The consolidated balance sheet published at the end of 1938 is simply another demonstration of the solidity of a structure that has been 60 years a-building.

Net profits for 1938 amounted to $28,875,000; current assets exceeded current liabilities by $64,489,000. Regular dividends were paid; as a further protection to stockholders and employees, $7,669,000 was added to surplus, bringing the total capital and earned surplus account up to $228,298,000 at the end of the year.

Those figures demonstrate what good men working with good tools can do—it tells, as we shall see, part of a story that is still in the making.

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## CHAPTER II.

### The Branches of the Family

THE DECADE from 1929 to 1939 was a contradictory one for the Standard Oil Company of California. During the first half of the current period there were the difficulties of depression; the petroleum industry was beset by over-production and price-cutting; taxation was costing the industry and its customers

THE FIRST SUCCESSFUL CALIFORNIA OIL REFINERY, built at Newhall, nearly sixty years ago by D. G. Scofield, first Standard of California president, bears little resemblance to the company's great plants at Richmond and El Segundo. It had a capacity of 100 barrels a day, was restored as a memorial to the company's founders.

over a billion dollars a year. Standard was affected with the rest, but the company trimmed sail, tightened its lines and successfully outrode the storm.

All that has been frequently reviewed; it is our purpose, therefore, to examine a lesser-known and more significant phase of the company's development. For while Standard of California was in the midst of fighting its economic battles at home, a contingent of its men were engaged in a struggle on another and distant front. Their efforts were to be rewarded and, as we shall see, their victory was to have a far-reaching effect on the map of Standard Oil.

*

"SHORTY" MOWRY wheeled his sleek grey and red streamlined tank-truck to shelter as the siren at San Francisco's big municipal airport screamed its warning of an approaching plane. Switching off the ignition, "Shorty" pulled a watch from his pocket, saw quickly that it read 5:25 and muttered admiringly: "Imagine that; all the way from Newark, and she's exactly on time."

There wasn't much about the schedules of the big transport planes that Shorty didn't know. He had been filling them with Standard Aviation gasoline for nine years and he had marveled as he watched the industry grow up. He had seen a tiny group of buildings huddled beside the Bayshore highway emerge, cocoon-like, into a great modern airport.

As the giant Mainliner rolled to a smooth stop, Mowry returned briskly to his work. But had he stood a moment longer and watched the passengers alight, he could not have helped noticing a gray-thatched, sun-burned man glance keenly at his truck and smile as though recognizing an old friend.

ON FARMS, AT CANNERIES, MINES, LUMBER MILLS and wherever petroleum products are used, Standard service men talk the language and are at home. That is no new sales development; it goes back to the days when the company dealt in candles, lanterns, stoves and harness and hoof oil.

THE GIANT RICHMOND REFINERY of the Standard Oil Company of California looked like this thirty-seven years ago, a few months after its completion in 1902.

GRAND

THE RICHMOND REFINERY FROM THE AIR. This gigantic and modern Standard of California plant was started in 1901 and has never ceased growing. Today, its capacity is in excess of 100,000 barrels of crude a day and it is rated one of the greatest oil refineries in the world.

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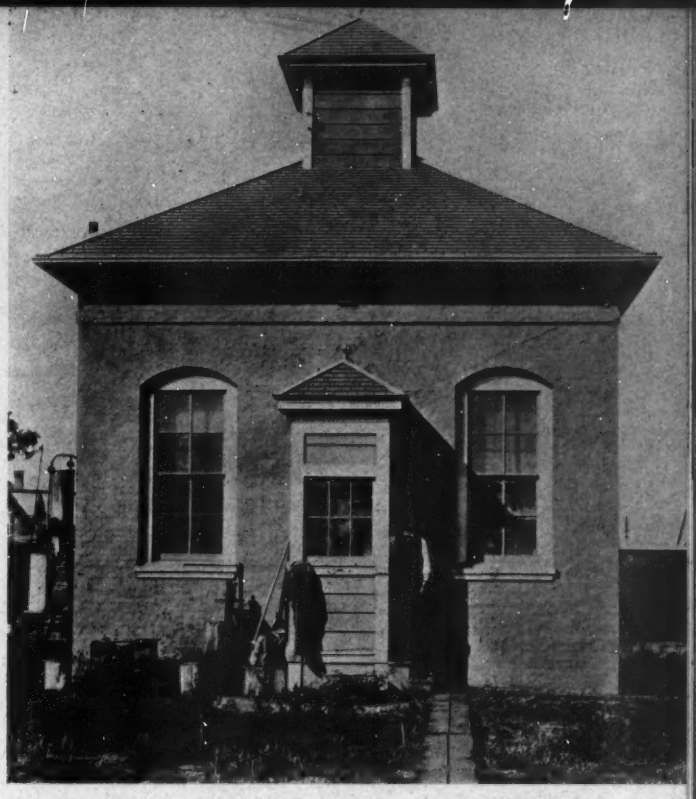
That man was Ed Skinner, just completing a 13,000 mile journey that had started in a chug-chugging motor boat on the Persian Gulf. His last view of a Standard Oil property had been a fleeting glimpse, from the window of an Imperial Airways flying-boat, of a cluster of buildings squatting under a tropic sun and, far in the distance, the Dammam Dome wells of California Arabian Standard Oil. And now, two weeks later and halfway around the world, he once more saw the mark of the company he had served for more than a quarter of a century.

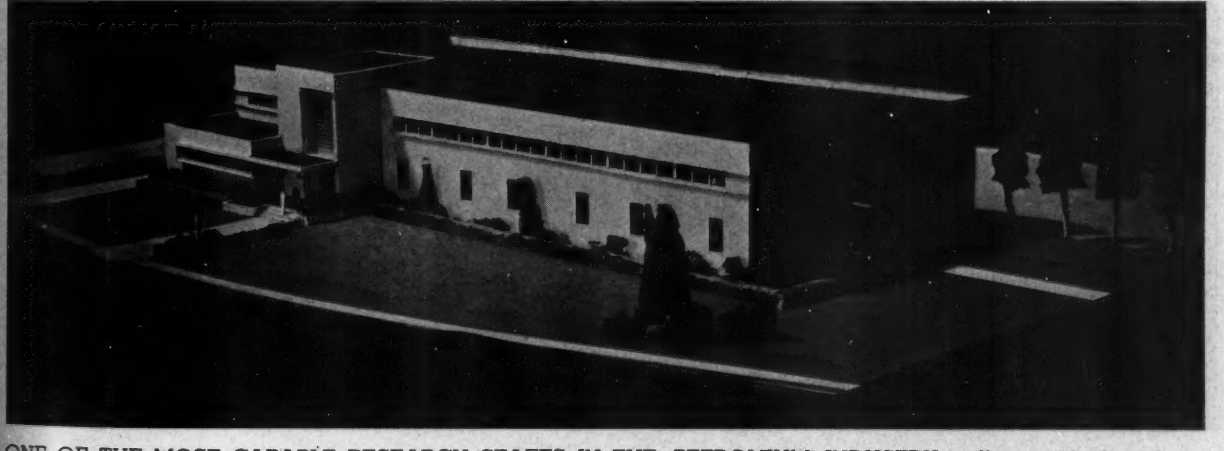
It is little wonder then that Mr. Skinner felt a signal of welcome as he read the familiar word "STANDARD" on the belly of the truck's tank. And, as he absently watched the truck move slowly down the field with its cargo of Stanavo fuel, perhaps Ed Skinner thought reflectively of the company it stood for; of its size, its scope and of the men around the globe who contributed to its greatness.

### The Family Abroad

IN ALL the oil history of the world there is probably no more exciting chapter than the one the Standard Oil Company of California has been writing for more than 8 years on the scorching sands of Bahrein Island and the Arabian desert. The story began prossaically enough in 1930 when two men went out from Standard's headquarters in San Francisco to conduct a geological reconnaissance on Bahrein, where the company had obtained an option on an oil concession. It was a routine matter of chance, a wildcat venture no different than a dozen other foreign explorations that Standard Oil had undertaken in the past. Perhaps those geologists would find indications of oil, perhaps



COMPARE THE STANDARD'S MODERN RESEARCH LABORATORY BUILDING, now going up on Standard Avenue, in Richmond, with the above picture of the Pacific Coast Oil Company's first laboratory. It was located at the Alameda Point refinery and most of the experimental work conducted in this tiny building was done on kerosene. For in those days of the last century, gasoline was a by-product, and coal oil was the big seller.



ONE OF THE MOST CAPABLE RESEARCH STAFFS IN THE PETROLEUM INDUSTRY will soon have a new workshop. At the Standard's Richmond Refinery, a new laboratory is going up, the model for which is shown above. When it is completed, it will employ the latest forms of artificial illumination, will cover approximately 30,000 square feet and will be entirely air-conditioned.

not; but Standard, always interested in developing new oil reserves, considered the chance worth taking.

Early in 1931, the two men returned quietly to San Francisco. In an encouraging report to the Board of Directors of the Standard Oil Company, they said in effect: "Gentlemen, we have spent six months on Bahrein Island; we have studied the terrain and we have conducted exhaustive tests for oil. We believe there is petroleum below the surface and we recommend that a test well be drilled."

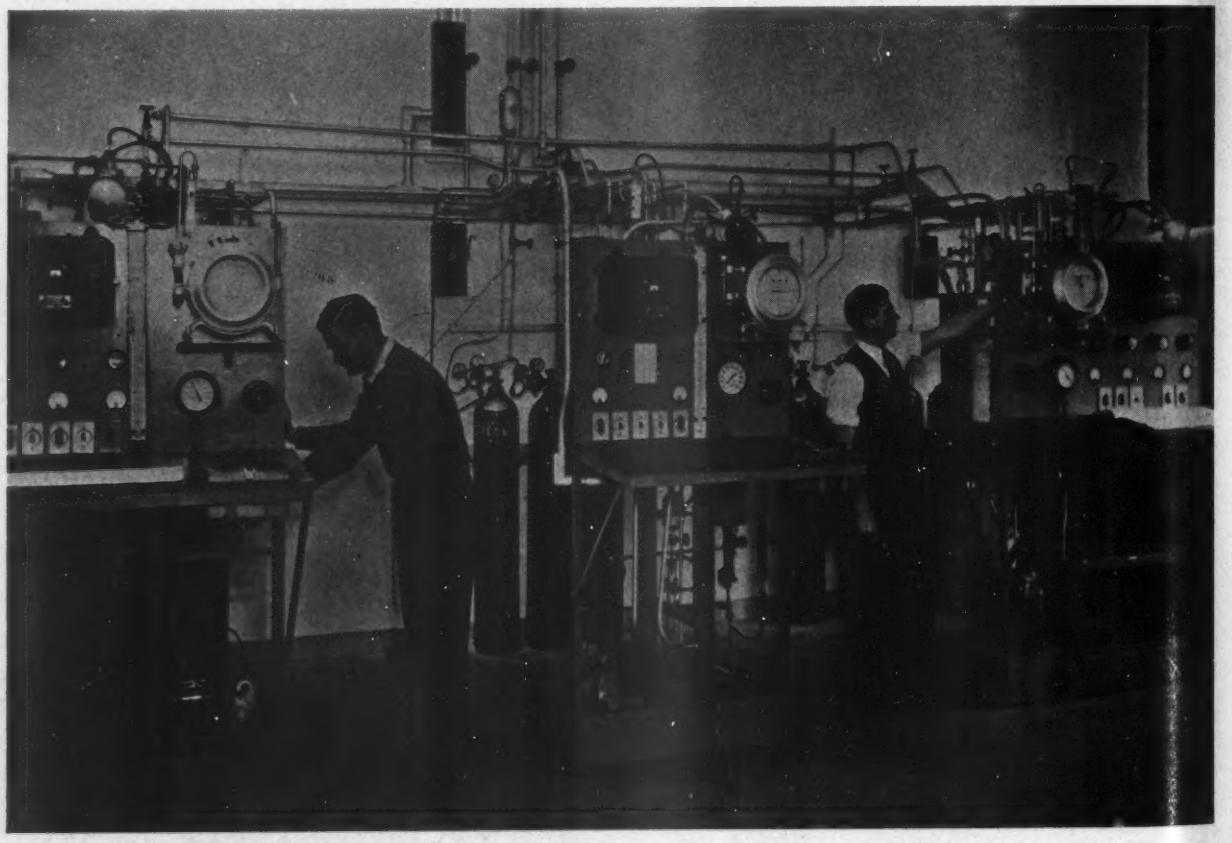
In April, 1931, E. A. Skinner, now manager of foreign production, and a drilling crew of 8 men sailed for Bahrein. The 13,000-mile journey took a month and a half; by the time they reached the island, Skinner and his men were itching to get started on their job of cutting through the earth's crust. But first a drilling site had to be selected, a temporary camp established, a rig constructed and drilling equipment assembled.

It wasn't until mid-October that the first cable-tool bit into the sun-baked promontory of Jebel Dukhan, the "Mountain of Mist." Then came months of toil under a merciless sun; in heat so intense that the workday began at six in the morning and finished at one in the afternoon.

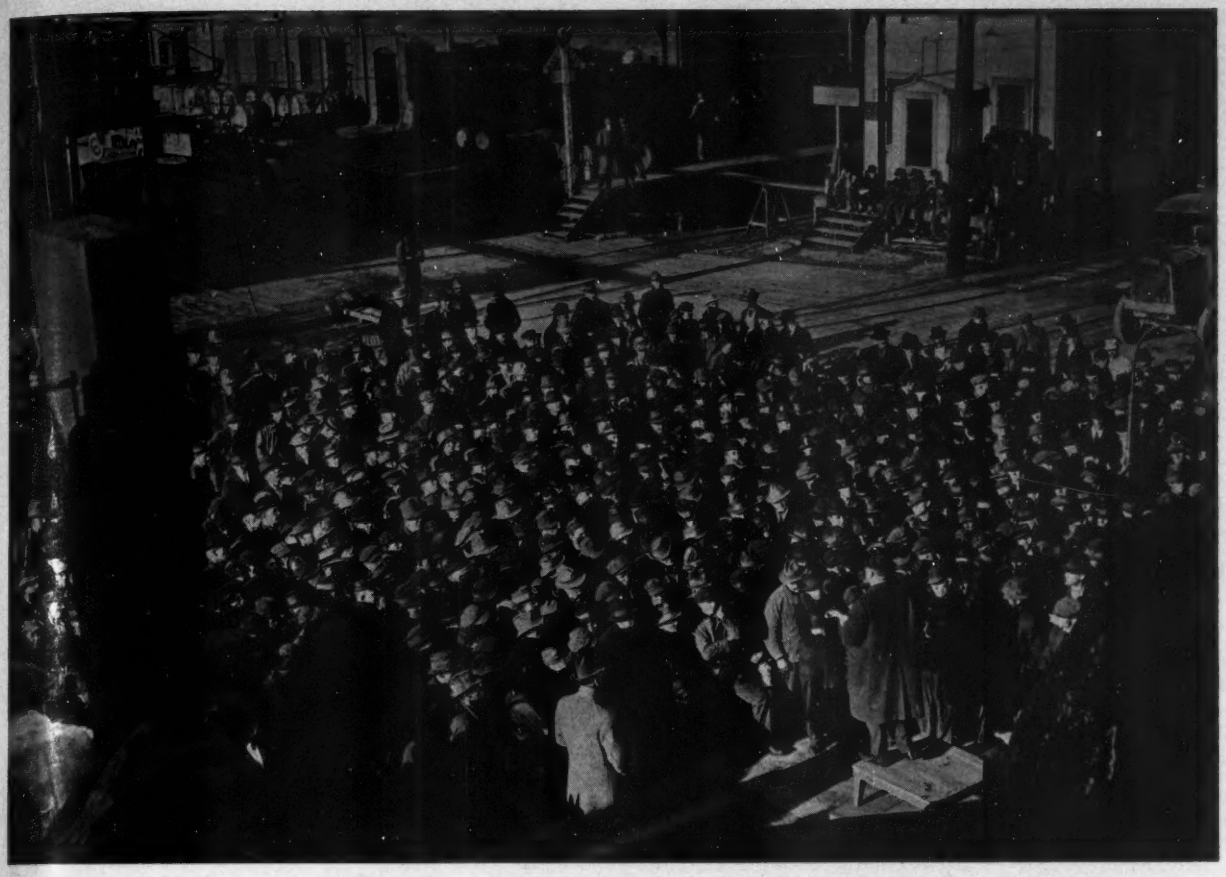
Finally, in June, 1932, 8 months after the spudding-in of the well, oil was discovered at a depth of 2,008 feet. The geological report had been justified; after years and years of profitless effort, Standard had at last "struck it rich" on foreign soil. But how "rich" had yet to be determined; to be sure, oil was there on Bahrein but the size of the pool and the depth of the sands were still unknown quantities that only further drilling could reveal.

Two and a half miles north of the discovery well, drilling was immediately started on Jebel Dukhan 2; again, at a depth of 2,008, a blowout occurred, a short test indicating an initial flow of 1,500 barrels of 33 gravity oil. Other wells were drilled to greater depth and by the end of 1933 it was apparent that the chance wildcat adventure that had begun two years before was about to pay dividends to its courageous inceptors.

Those final discoveries signaled the beginning of a new era for Standard of California and its subsidiaries. In a whirl of intense activity, the company was to



"NEVER BE SATISFIED WITH THINGS AS THEY ARE" is the watchword of the 300 Standard Oilers who make up the company's Research and Development Department. It is their job to continually seek something new, to improve products and to change existing methods. The pressure equipment shown above is just one of the things you see in the chemical research laboratories at Richmond.



THE ORDER OF SERVICE is something all Standard Oilers are proud of. The historical picture above shows the first presentation of Service Pins, on January 10, 1916, to 203 Richmond Refinery employees.

broaden its scope, increase its stature and take its place on the international scene.

### Men, Money and Management

TO ASSUME such an undertaking was ambitious indeed; but Standard Oil, even during the depths of depression, was rich in the attributes that would be needed. Here it would take courage and spirit. It would take capital. It would take reputation, and here the company was to learn the value of its long-practiced policy of fair play, at home and abroad.

More important, perhaps, than anything else was the sudden need for loyal, intelligent men who could handle the job. Fortunately, Standard's policies of employee relations had provided for just such an occasion; the company could select from its own rolls hundreds of men who could be depended on to fill almost any position that might arise in the oil business.

### When There's Work to Be Done

AS YET no provision had been made for the transportation and refining of the oil that lay beneath the scorching floor of Bahrein Island. There were other problems, too; if the company was to continue its drilling program and build a refinery, pipe line and oil port, it must also build a city where Standard Oilers could live in comfort. During 1934 and the years that followed each of those problems was to be solved in its turn.

One late December day in 1933, the prow of a ship with a white "S" on her stack nosed her way slowly past the Los Angeles Harbor breakwater and headed straight out across the Pacific toward the setting sun. It was the Standard Oil tanker "El Segundo" and she was starting on the first leg of a voyage that would take her across 180 degrees of longitude, from the greatest petroleum shipping point in the world to a port on the Persian Gulf that might some day prove a rival.

In the "El Segundo's" hold was one of the strangest cargoes that any tanker ever carried. The customs-list read like the combined inventories of a machine shop and a boiler factory. There were miles of pipe, an acre or more of sheet steel, tanks, trucks, trailers, tractors, air compressors, welding equipment, a derrick, all manner of safety devices and 40 tons of anchor. There was other, even more incongruous cargo, lashed to her deck and stowed in her hold.

Manning the decks of the "El Segundo" was as unique a crew as could ever be found. With few excep-

tions they spoke, not in nautical terms, but in a language that is best understood in Taft, El Segundo, Coalinga, Richmond and at 225 Bush Street in San Francisco. But that is easily explained; most of the 45 men on board were Standard Oilers who had come from those famous California oil towns.

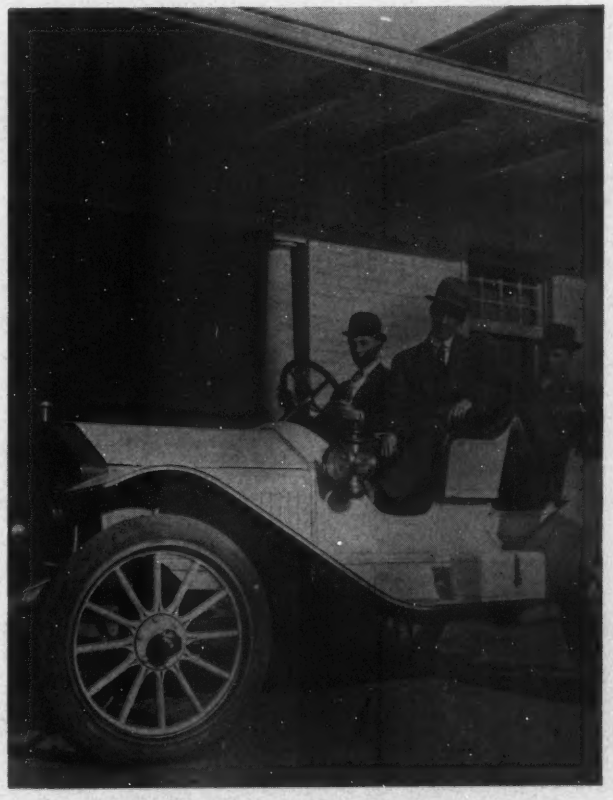
On Washington's Birthday in 1934, 53 days out of San Pedro, the "El Segundo" dropped anchor in the open roadstead of the Persian Gulf, 3 miles off the coast of Bahrein Island. In the incomparably short time of 105 days, her crew of trained oil men, with the assistance of proficient native laborers, was to perform tasks that will forever testify to the ability of Standard men.

They were to build a freight-handling pier, complete a road and trestle across the narrow channel that separates Bahrein and Sitrah islands and lay approximately ten miles of gathering line from the inland producing area to the shore. They were to lay a 12-inch submarine line from the edge of Sitrah Island to the deep channel, 3 miles out in the Persian Gulf. They were to erect three crude-oil working tanks of 250,000-barrel capacity, install a complete pumping station and build a ballast-water tank as a precaution against harming the important fishing industry of the islands. They were to accomplish a score of other things to the end that this new oil port would not suffer by comparison with any in the western world.

On June 7, 1934, a month ahead of schedule, the "El Segundo" weighed anchor and set her course for California; in her hold, this time, was a cargo of 25,000 barrels of Bahrein crude. That oil had come from a field that the producing department had begun developing less than two-and-a-half years before; it had flowed through gathering lines to a modern and efficient marine terminal. Finally, that oil had been pumped to the hold of the "El Segundo" through a submarine pipe line.

Now if you know the oil business in foreign lands, you also know that in addition to men, means and money, that kind of rapid development requires a modicum of luck and a maximum of help. In the independent state of Bahrein, the company received its share of both; luck—in finding the oil in a land governed by a wise and prudent ruler; help—from every side. His Excellency Sheikh Hamad bin Sheikh Isa al Khalifah was cooperative from the very day the first Standard Oil geologist landed on the island. He attended the ceremonious spudding-in of Jebel Dukhan No. 1 and his interest in the Bahrein Petroleum Company's operations never waned. Neither did the interest of his 120,000 subjects; together, they contributed

HORSES AND MULES did most of the hauling in the Midway-Sunset 22 or 23 years ago; back in '16, it took a day to bring a load from Bakersfield to Taft.



TWENTY-FIVE YEARS AGO, the handsome white automobile pictured above was the pride and joy of the Standard's production men in San Joaquin. Notice the fenders and the big carbide lamps.

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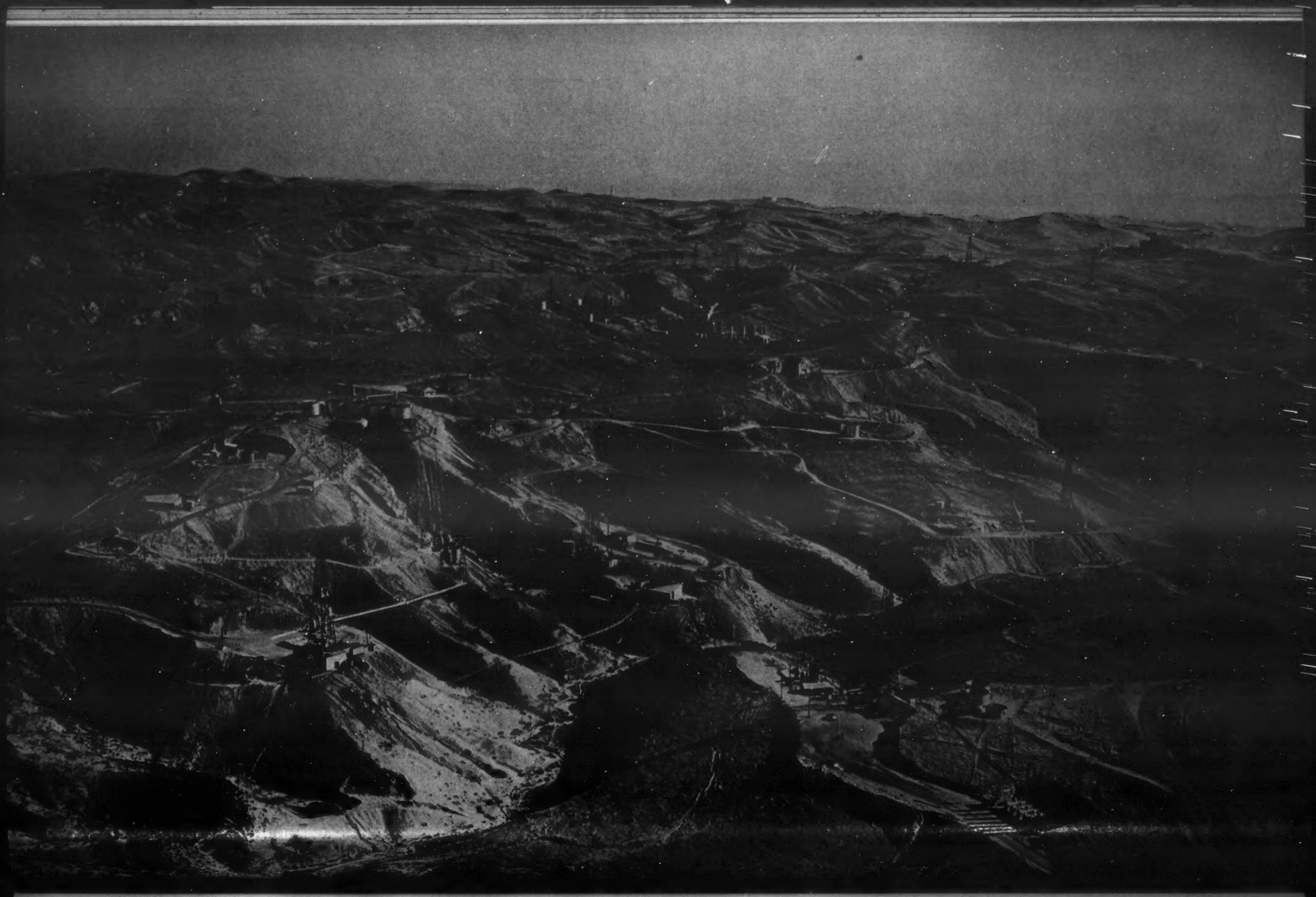
ATTENDING THE PRODUCING DEPARTMENT SUPERINTENDENTS' MEETING at Murphy Camp, Sept., 1916. Top Row—Left to Right; W. O. Todd, W. H. Berg, Cyrus Bell, Dr. E. A. Stark, W. S. Smullin, B. P. Tracy, F. H. Hillman, W. G. Black, J. M. Atwell, R. A. Halloran, J. B. Newton and H. R. Longaker. 2nd Row—Left to Right: H. C. McLean, F. D. Martin, J. H. Hillman, W. M. Brown, C. R. Little, L. B. Little, W. I. McLaughlin and Walton Young. 3rd Row—Left to Right: J. O. Dailey, W. J. Sprenger, C. C. Scharpenberg, G. L. Parmenter and C. A. Dailey.



STANDARD WELLS IN THE KETTLEMAN NORTH DOME FIELD. Ten years ago the monotony of these rugged, unlovely hills was broken only by a few sagging derricks and occasional piles of rusty, twisted pipe.

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immeasurably to the company's success and progress on the archipelago.

By the end of 1934, The Bahrein Petroleum Company had completed 14 wells and produced 317,350 barrels of crude oil. Then, in November, 1935, with an average daily production of 6,500 barrels of oil and approximately 10,000 acres of proven oil land, the company announced plans for the construction of a refinery on Bahrein that would be near the promising markets of the East. This gigantic task was taken in stride and before another year was out Bahrein Petroleum had erected a modern, 10,000-barrel capacity refinery. Meanwhile, the company had built an amazingly complete air-conditioned city for its employees. And in July, 1936, the Standard Oil Board of Directors announced the completion of an even-up deal with The Texas Corporation which would provide ready and established outlets for the ever-increasing yield of the Bahrein field and refinery.

Thus, in considerably less than a decade, a subsidiary of which Standard of California owned a half-interest began to introduce gasoline, kerosene, diesel and fuel oil into the oil-hungry markets of Asia and Africa. And every drop of it had been produced, transported and refined by Standard men on Standard property in the Near East.

### Another Movie Thriller

THAT IS the first episode of Standard Oil's story in the Near East; the second followed closely on its heels.

Thousands of words have been written about the Standard of California's oil discovery in Saudi Arabia, but none can compare, in dramatic quality, with the sixteen-word message that sped across an ocean and two continents one June day in 1936. Addressed "Standard Oil, San Francisco" and signed "California Arabian Standard, Jubail," it read simply: "Dammam Dome discovery well brought in today Depth twenty one fifty two feet Gravity fifty three." Just that, no more; yet that terse cable climaxed years of prospecting in one of the few lands in all the world that had never been surveyed for oil.

ON THE BONDOC PENNINSULA, in the Philippines, Standard Oilers spent years in a discouraging search for petroleum. The venture was finally abandoned in 1924, but not until a thorough test had been made.

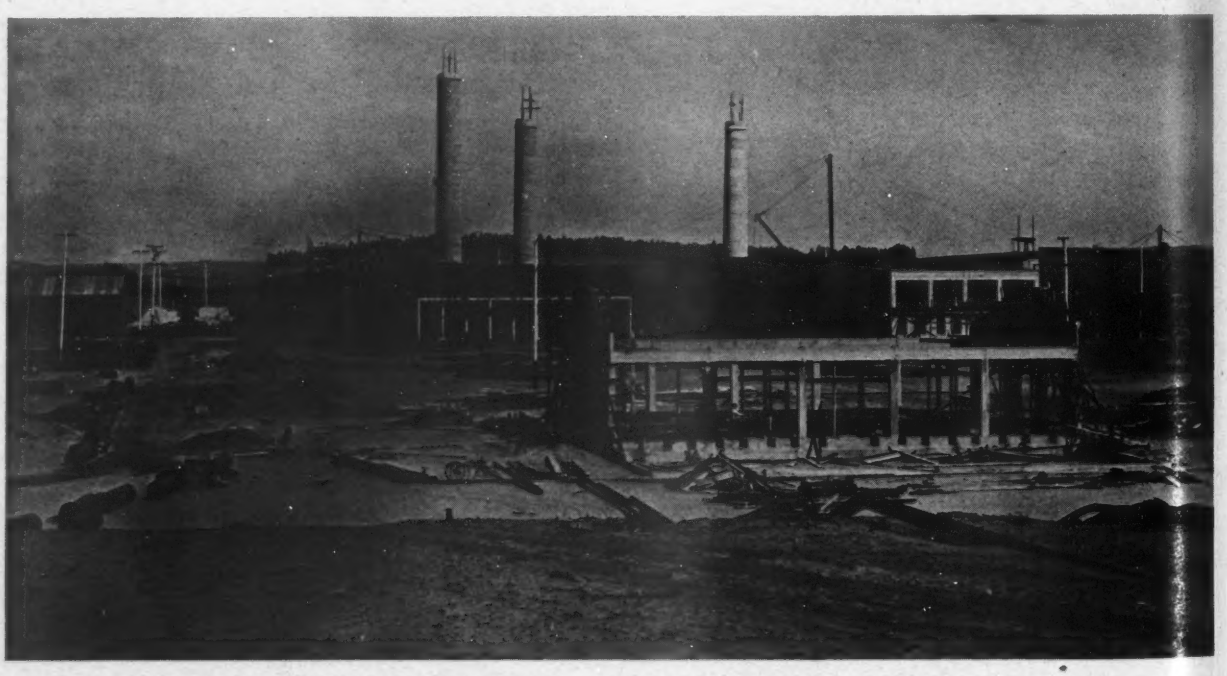
THE STANDARD OILERS who travelled the pipe-lines in 1916 generally made it a point to throw a roll of blankets in the back of their wagon. Going out on a welding job frequently meant a week away from home.

It is a story packed with all the excitement of an Oppenheim novel; but it is a true story and all of it actually happened. It could tell of the continuous fight against blistering heat, sweltering humidity and withering wind. It could tell of Standard geologists who were among the first non-Mohammedans in history to cross Saudi Arabia from the Persian Gulf to the Red Sea. It could tell of bearded Standard Oilers in native **gura** and **aba** being royally entertained at the palaces of His Majesty Abdul Aziz ibn Abdur Rahman ibn Faisal al Sa'ud, the intelligent and gracious ruler of Saudi Arabia who had granted Standard permission to seek oil on approximately 165,000 square miles of his land. It could tell of journeys across the limitless and rocky desert, without roads and so windy that the dust-filled air was like a blinding fog. It could tell of camel caravans, of huge "doughnut" tires ripped to shreds by jagged rocks, and of breakdowns miles from nowhere. It could tell of strangely delicious dinners and oriental courtesy in handsome homes clustered around palm-fringed oases. It could tell of Bedouin chieftains and wandering Arab tribes and it could tell of many more strange and interesting sights.

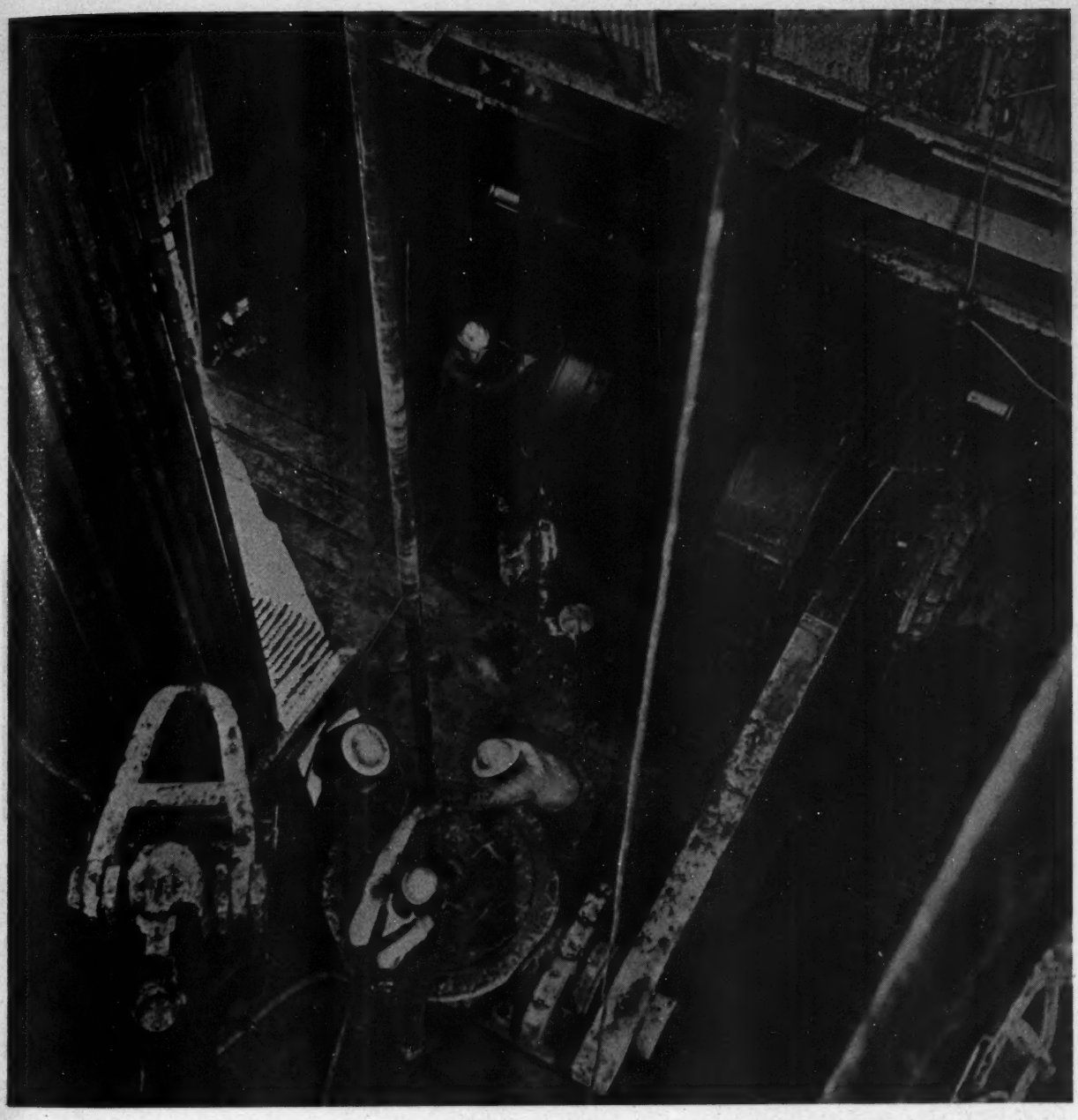
Altogether, this story of Standard East of Suez would make a fascinating movie serial, all the more thrilling because every word of it is true. It would please the average American audience because it roars swiftly along toward its smashing climax. Best of all, it has a happy ending—the breath-taking discovery of oil beside a barren, dome-like hill in the heart of the Arabian desert.

But Standard is in the business of producing oil, not Hollywood thrillers. The blowing-in of a discovery well, whether it is in California or Wyoming or Saudi Arabia, is like the bark of the gun in a track-starter's hands. That is when the real race begins—and so it was at Dammam Dome.

In a series of planned steps, new wells were drilled to a greater depth and the field was developed in orderly fashion to determine the size and extent of the pool. Next, a pipe line was laid across 43 miles of rock and sand from the Dome to tidewater. Storage tanks were erected and an up-to-the-minute marine terminal was constructed at Ras Tenurah, on the Gulf. Finally, a functional, streamlined city was built, planned exactly to fit its part of the world and to keep



IN 1911, STANDARD'S EL SEGUNDO REFINERY rose slowly on the sands near the Pacific Ocean. The modern city of El Segundo was nothing more than a seaside village in those days.



FROM EIGHTY FEET ABOVE, the camera watches the derrick crew making up drill pipe on a Standard rig.

Standard Oilers and their families cool, comfortable and rested between intervals of work and recreation. The city is called Dammam and it is complete with spacious, air-conditioned cottages, club buildings, a hospital, tennis courts, theatre, a golf course and food, water and power supplies.

That, briefly, tells the story of the California Arabian Standard Oil Company as it can be written today. What the future holds is beyond conjecture, but this much may be ventured: With a sixty-year drilling concession in an area larger than California; with 5,000 barrels of oil already being transported daily from Dammam Dome to the enlarged refinery on Bahrein Island; and with established marketing facilities already provided, the Standard Oil Company of California will surely be well on its way toward the topmost rung of the world petroleum ladder before another decade passes.

### The Modern Geography of Standard Oil

IF, IN 1939, you were to attempt to visit the principal producing and refining properties of the Standard Oil Company of California, your travels would take you

IN ALASKA, Standard of California is once more boring down into the cold earth in search of oil. Old-time production men with the Standard know this is not new territory to their company; years ago Standard began looking for petroleum in the frozen north.

to many strange places around the world. You would follow broad, concrete highways; you would ford roaring mountain streams; you would cross desert and wasteland that tires had never marred; you would shiver in the snow and sweat in the sun, and seek shelter from the wind. For you would be following an endless and changing trail—the trail of oil.

Your trip would start, of course, in California, for that is where the greatest concentration of Standard Oil properties is to be found. At Richmond, on a crowded arm of land that reaches out into San Francisco Bay, you would see the largest and most complete refinery in the West. If you took the time to inquire, you would learn that this modern plant employs 2,500 men, that $14,000,000 has been invested in it during the last 3 years and that a new building on Standard Avenue will soon be added to the company's vitally important research and development facilities.

About 250 miles south of Richmond you would catch your first glimpse of the oil derricks that break the monotony of the flat San Joaquin Valley and the barren hills beyond. You could criss-cross that country and on over the ridge toward the Pacific for days and you would seldom lose sight of the rigs. You would see the rickety, 60-year-old wooden derricks of Pico Canyon, where the Standard Oil Company first saw the light of day; you would see a new-type derrick towering 179 feet above Standard's Mushrush #2 in the Wasco field. You would see the famous Kettleman Domes and almost wherever you looked there would be plenty of Standard wells.

In some of these fields you would see Standard topping plants and stretching across the broad valley and over the rolling hills toward tide-water you would see the Estero pipe-line which the company built, as an economy and emergency-employment measure, in 1932. Before leaving the valley to cross the rugged Tehachapi Mountains into metropolitan Los Angeles, you might stop for a time in Bakersfield and visit the big pumping station on the edge of town and take a quick look at your second Standard Oil refinery.

There are a great many Standard of California properties to see in Southern California. You would first want to visit the company's great refinery at El Segundo, a city of 4,000 population which owes its size, prosperity and very existence to the Standard Oil Company. The refinery itself is an enormous, modern plant with a crude rating of 100,000 barrels capacity a day; it employs about 1,300 people and it has a storage capacity of 30,000,000 barrels of oil. Like other Standard properties, it has been growing steadily since its inception 28 years ago; in the last few years millions of dollars have been spent on modernization and additions to the plant.

From El Segundo it is only a skip and a jump to the fantastic, forest-like fields of the Los Angeles Basin—Huntington, Long Beach, Santa Fe Springs, Wilming-

ACROSS THE BLISTERING SANDS OF ARABIA, Standard Oilers lay a 10-inch pipe line, from the Dammam Dome Field to the Standard-built petroleum port of Ras Tanura, a distance of 43 miles.

ton and the dozen or more lesser fields in the district. The discovery of those first 3 made front-page news in the early twenties; they made headlines again in 1929 when the deep sands were discovered; and still, nearly two decades after the first great gusher, those fields continue to pour forth crude in prodigious quantity—3,300,000 barrels in January, 1939.

And all through those derrick-covered, oil-soaked fields of Southern California, as in most any field that you enter in the state, there are producing and shut-in wells belonging to the Standard Oil Company.

Beyond the borders of California, in Texas, New Mexico, and throughout the states of the Rocky Mountain Area, there are other Standard oil lands and other Standard wells to see. At the close of 1938, the company had 458 wells in Texas, 62 in the mountain states and 15 in New Mexico; together, they produced approximately 5,000,000 barrels of oil.

Finally, in the Near East, there is the modern refinery on Bahrein Island and development-rights on a tremendous oil-land acreage in which the company owns a 50% interest; in Saudi Arabia alone the rights extend over 105,000,000 acres.

In your travels, you would have had only a quick look at the producing and refining properties of Standard Oil of California. You would know at a glance, however, that they represent a great company, sturdy, sound and world-wide in scope. And from all those production points, oil is pouring into Standard refineries and thence out into markets in nearly every civilized country and on every continent in the world.

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## CHAPTER III.

### The Family At Home

IT IS 1929 and in New York, Peoria and Coalinga, California, bankers, builders and bootblacks are afflicted with a strange, incurable disease called "stockmarket fever." All over America, the signs of prosperity continue to soar; in New York, a famous auctioneer sells 748 rare books for a million dollars; in Washington, newly-elected President Herbert Hoover confidently reiterates his campaign promise of "a chicken in every pot and 2 cars in every garage"; simultaneously, from Detroit, comes word that the year's production schedule of the automobile industry calls for the manufacture of 5,000,000 cars.

In the United States, people and names make spectacular news. In Baton Rouge, Louisiana, the "Kingfish,"

IN UNINHABITED REGIONS OF THE TROPICS, conditions are far different from those we find here in California. The photograph above shows some of the transportation difficulties the Standard Oil Company faced in the Philippine wildcat venture which began in 1919 and ended five years later; in all those years, oil was not discovered in commercial quantities.

SIGNAL HILL, famous Los Angeles Basin oil field, is a prime example of town-lot drilling and the disorderly, wasteful development of a precious oil-reserve. It presents an interesting contrast to the careful development of Kettleman Hills, where the wells are wide-spaced and the oil is held in reserve until it is needed.

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Huey Long, writes political history by establishing an absolute dictatorship in his state domain; in Chicago, a swarthy, heavy-jowled Sicilian named Al Capone rules a nation-wide crime ring whose activities net millions in income a year; while down in the warm blue waters of the Gulf, the U.S. Coast Guard's sinking of the liquor-laden Canadian Steamer, "I'm Alone" causes an international incident.

In 1929, industry, too, receives its share of attention. From around the world comes news of the progress of aviation: Regular airmail service between New York and San Francisco is established on a 31-hour schedule; Colonel Charles A. Lindbergh opens a new air route between the United States and Central America; the Graf Zeppelin circles the globe in 21 days. Transcontinental Air Transport and the Pennsylvania Railroad jointly advertise 48-hour, coast-to-coast plane-train service and Commander Richard E. Byrd, flying over Antartica, claims that vast, icy wasteland for his country.

And in the world of oil, 1929 is also a banner year. Flush production from the deep-sands at Santa Fe Springs and Signal Hill helps to push total U.S. crude production over the billion barrel mark. Oil storage stocks in the United States represent a capital investment of $1,000,000,000; in the greatest scandal in petroleum history, a broken and sad little former Secretary of the Interior, Albert B. Fall, is convicted of accepting a bribe. And, almost as if it had been planned as a 50th anniversary gift, Standard of California production men present their company with its first Kettleman North Dome well, bringing it in under control with an initial flow of 4,000 barrels of 61 gravity crude.

### In Their Own Backyard

IT WAS MID-NOVEMBER in 1928 and a lone, dust-covered car bumped slowly along the rocky and rutted road that leads from the floor of the fertile San Joaquin up over a ridge of forbidding hills and on through Cottonwood Pass to the Pacific. To the average tourist this would be a country to go quickly by, for it is barren and raw and unlovely.

But to the two men seated in the crawling car, there was nothing unlovely about those hills. For they were M. E. Lombardi, then a Standard of California director (since becoming a vice president), and Roy Fry, general superintendent from Taft, and they knew things

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AS STRANGE A CARGO AS ANY OIL TANKER EVER CARRIED. That is the way the crew of the Standard's tanker El Segundo described the odd assortment of equipment and supplies which were stowed in her hold and lashed to her deck on the historic trip she took to Bahrein Island, in the Persian Gulf off the coast of Arabia, in 1933.

about this wild stretch of country quite beyond the grasp of the casual sight-seer.

Those men were old-time oil producers and both of them had spent years at hard labor in this hot and desolate part of California. They knew every **barranca** and every hill along the west side of the San Joaquin. They knew that ten miles due north of the dusty road they were travelling lay the famous old Coalinga field and that to the south, in one jagged line nearly a hundred miles long, lay the great West Side oil fields—Lost Hills, Belridge, McKittrick, Elk Hills, Midway-Sunset, Maricopa and Wheeler Ridge.

As he drove the car up the winding road into that part of the Temblor Range known as Kettleman Hills, perhaps Mr. Lombardi reflected on other things he knew of this rugged region. Of the 20 miles of dry holes that had been drilled on the three Kettleman domes in a ceaseless search for oil; of the hopes and discouragement of the hundreds of other oil men who had sweated here under a blistering summer sun.

One thing is certain; Mr. Lombardi, in common with most California oil men, knew that the disappointing search for oil beneath the uneven surface of Kettleman Hills was finally finished. It had been a long and tedious hunt; the record shows that by 1900 nine wells, varying in depth from 260 to 1100 feet, had been fruitlessly drilled. And in the 28 years that followed, other enterprising bands of oil men had punctured that forlorn region in 29 different places.

Along their way these two men could see many signs of the belief men had in this region—evidence in the form of sagging derricks, rusty pipe, abandoned wells. This faith had not seemed unreasonable; as far back as 1908 a Standard Oil staff geologist had reported to his company in this vein:

"Every indication I have seen points toward one conclusion—there is oil underlying Kettleman Hills. How far down it is impossible to say but this is sure—Kettleman is undoubtedly a most favorable place for the accumulation of vast quantities of lower Miocene oil."

It took two decades to prove that statement but it did come true. At three o'clock on the morning of

WHEELER RIDGE, in the San Joaquin Valley, was one of the fields which Standard Production men discovered in 1919 in their never-ending search for new oil reserves.

THE REFINERY THAT STANDARD BUILT in West Texas to take care of its production from Mitchell County and the Yates Pool, 200 miles away. Bridging the gap is a Standard-built pipeline, stretching straight across the flat brown Texas country.

October 6, 1928, from a mile and a half below the surface of the brown hills, the Milham Exploration Co.'s Kettleman discovery well blew in with a roar that must have sent thousands of ground squirrels and jackrabbits scurrying for cover. At first it blew only gas but the gas was rich in petroleum vapors. Three weeks later it was making 35,000,000 cubic feet of gas and about a thousand barrels of oil a day. By November 13th, production had increased to 4200 barrels of 60° gravity oil a day—oil so light and clear that it could be used in a car exactly as it came out of the ground.

Thus Kettleman North Dome was finally brought in—not as an ordinary field at all but as one of the greatest potential oil fields in the world, producing a rare quality of oil almost unknown in the industry. Certainly it was a rich prize for the Standard Oil Company of California, for to them this bleak landscape was a giant 60,000 acre checker-board and they owned every other square.

The work of the Standard was clearly defined and it was to get that work under way that Lombardi and Fry were there on the ground. Offset wells must be drilled, a temporary camp constructed, transportation facilities planned, water and power provided and equipment hauled in. Those were no simple problems. Kettleman was remote and there were no roads to speak of. The oil bearing sands were deep, the pressure was tremendous and to bring their wells in under control would require every bit of ingenuity at the company's command.

But as usual the Standard had the men and the brains to cope with those problems. They lost no time; within six weeks there were 75 Standard Oilers in the field; water was piped in; a camp was located on the present site of Avenal. Engineers and oil equipment men were called in and between them they devised new types of equipment to use on the offset well. And on July 20, 1929, less than seven months after drilling was started, Standard of California brought in its first successful Kettleman well—under control and with an initial flow of 4,000 barrels a day.

### The Family Comes First

That is the story of the beginnings of the Kettleman North Dome field; there is a great deal more to be told. But even in a review of this breadth, we can only touch lightly upon the developments that followed and upon the role that Standard played.

Within 18 months of the spudding in of the company's first offset well, there were over 2,000 Standard Oilers in the field. Some of those men were drilling new wells; others were beginning to build Avenal which, as a Standard of California protege, was to become an attractive oil community of 3,000 people. By then the depression had struck with full force, and, as an emergency employment measure, the company brought men from El Segundo, Richmond and other Standard properties to construct a 68-mile pipe line which was to begin on the crest of Kettleman Hills and end, as the world's largest submarine line, some 3,000 feet out in the Pacific. The Standard was providing other members of the Family with unusual jobs; some of them were building roads over the rugged hills; some were digging water wells, while others were laying nine miles of water pipe across the field to Avenal. Power lines were being strung, pump stations set up and operated and equipment hauled by tractor where roads were not yet in. And almost without exception, those jobs were given Standard men. For times were hard and jobs were scarce and at Kettleman, as elsewhere around the world, the Standard took care of its Family first.

All this has been important, not alone to the company but to its stockholders and employees as well. The thoroughness and care with which the Standard Oil Company of California has developed its properties is there in Kettleman Hills for all the world to see. But the company has done much more than that, as we shall presently see.

### A Dual Role

It is not the purpose of the California Oil World to preach or to extol the virtues of the Standard or any other oil company. Our job is to dig out and present the facts; they, in their turn, can speak for themselves. About the first decade in Kettleman Hills, this much, however, may be said. In spite of difficulties and disturbances, in spite of flurries of overproduction and of allotment and curtailment disagreements, Kettleman North Dome has been, by all odds, the best example of an orderly developed field that California has yet seen.

In the very beginning, the company voluntarily agreed to carry out any program of conservation which the Secretary of the Interior, representing the Government's lessees on some 45 percent of the Kettleman acreage, might propose. The moment agreements were

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Looking down ON STANDARD'S GIANT EL SEGUNDO REFINERY. When this modern oil plant was started in 1911, the town of El Segundo was a tiny seaside village; today it is a progressive, up-to-the-minute industrial community.

STANDARD'S EL SEGUNDO REFINERY has never stopped growing during its 28 years of existence. The high and low pressure gasoline rectifiers, shown above, are one of the newest additions to the plant.

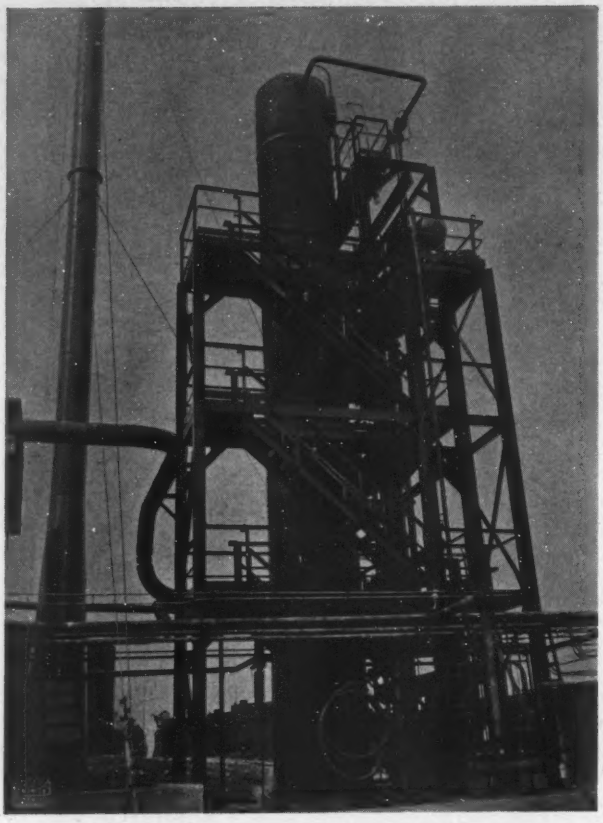
signed, W. H. Berg, then Standard Oil vice-president, told his company's production men:

"We will stay within the limits of our allotment and we will conform exactly to the curtailment program. By exactly, I mean just this: Never go a barrel over your allotment; if there is the slightest doubt, keep well under your production schedule. We pledged ourselves to abide by the agreement and the company will keep its word."

And, through a decade that saw 200,000,000 barrels of crude oil and one and three-quarters billions gallons of natural gasoline produced at Kettleman Hills, the Standard has kept its word.

A little lesson in simple arithmetic provides final and convincing proof that Standard of California has played the game. The company owns outright 47 plus percent of the acreage in Kettleman North Dome; owning alternate sections, Standard could have produced barrel-for-barrel with every operator in the field. Yet, in the interests of peace and the maintenance of a sound program of conservation, Standard of California has taken only 39 percent of the field's total production—or, in terms of oil, about 25,000,000 barrels less than its share.

It has meant peace at a high price but, as most oil men agree, Standard has been the savior of Kettleman



IN BRITISH COLUMBIA, Standard manufactures petroleum products for its Canadian customers at Standard of British Columbia's Burnaby Refinery. The low pressure tower distillation plant shown above is one of the units in this 2,000-barrel-daily-capacity refinery.

as a field. There could have been waste; there could have been disastrous over-production; a chaotic price condition might have resulted and the field might already have been sucked dry. Instead, Kettleman remains today one of the world's great oil fields—a tremendous crude reserve that will doubtless be needed in years to come.

### Against Another Rainy Day

In the California oil industry, the 1920's closed on a note of abundance. There was, in fact, more oil than anyone knew what to do with. Kettleman Hills had provided a tremendous new source of oil but that, fortunately, was being conserved. The trouble lay in the Los Angeles Basin fields; in '27 and '28, the deep sands had been discovered at Santa Fe Springs and Signal Hill and by October, 1929 those two tremendous fields were jointly producing 431,000 barrels of crude a day. Forty million barrels of oil had been added to storage since the beginning of the year and the state's storage facilities were almost exhausted. Altogether, Califor-

RICHMOND REFINERY POLYMER PLANT CONTROL ROOM, where constant watch is maintained on temperatures, pressures, rates of flow, etc., at dozens of points throughout the plant.

OLD-TIME STANDARD OILERS get together for a luncheon in their honor at El Segundo, home of the company's great Southern California refinery. These retired members of the Standard Oil Family seem to be having a great time and R. W. Hanna, at the end of the table near the camera, is right at home among his old friends.

nia's fields were producing 200,000 more barrels of oil a day than were needed.

Such was the condition of the oil industry in California at the close of the decade. Compare that with the situation on the Pacific Coast in 1920, at the **beginning** of the decade, and you get a significant picture of the hazards of petroleum. Storage stocks were then at a dangerously low point and were rapidly decreasing. The daily production was far below daily demand. A devastating gasoline shortage followed and California was forced to import petroleum products from the Mid-Continent, the Rocky Mountain area and from Mexico. Worse still, the future held little promise of change for during the preceding year 65 percent of the State's production had come from two fields. If those failed, as they might conceivably do, what then of the rainy day?

Facing that situation and aware that gasoline consumption was increasing with seven-league strides, Standard of California launched an intensive search for oil. In the years that followed, they found it—in practically every major field in California, in other states, and, finally, in other countries. "Standard Luck" came to be a by-word among oil-men but that phrase, of course, leaves much untold.

Those who call Standard Oil's discoveries "lucky" fail to mention what goes before—the years of wildcatting, the millions poured into dry holes, the hardships and heart-breaking disappointments, the patience and fortitude.

Standard will be the first to admit that the rewards have been worth the effort—but that doesn't minimize the struggles. Let's examine, briefly, one of the more titanic struggles.

IT WAS CHRISTMAS DAY in 1923 and a group of men lolled comfortably around the screened porch of a white-roofed cottage on the other side of the equator. Outside, the sun beat mercilessly down on the green jungle that hemmed them in; occasionally they could hear the screech of a tropical bird and, interminably, giant mosquitoes hummed and beat their wings against the fine wire netting.

Inside, a deeply sun-burned man said quietly: "Well, this makes my fourth Christmas away from home and I can't say I mind it so much. Sure, once in a while a guy gets homesick, but digging for oil, whether it's here in the Philippine jungle or in the Midway, is pretty much the same. We get good chow, good pay and good living quarters,

which is about all a fellow can ask for. There's only one thing—I sure as hell wish we'd find a little oil sometime."

The man who spoke was Carl Newcomb, Standard Oiler, and he had been one of the group of 25 Standard of California men who had sailed for the Philippines on December 3, 1920. Now, three years later, only four of that original group remained; 16 were back with the Standard in California, 2 were vacationing in Europe and the other 3 were just then returning to California to tackle new assignments with their company in the booming Los Angeles Basin fields.

As Newcomb finished speaking a young man in the group spoke up eagerly; "Say, Carl, tell some of us newcomers a little about your first few months down here on Luzon. Was the going pretty tough?"

"It sure was, at first," Carl Newcomb answered him. "All we had was a temporary camp down on the beach. We had to cut a road through three miles of jungle and haul our equipment in—millions of pounds of it. Once that job was over, we began setting up this permanent camp—first, the hospital, then the cook house and finally the living quarters. We had plenty of cooperation from the authorities and some help from Filipino workmen we'd hired. But even so, it took months to get this country in some kind of shape so that we could really go to work looking for oil.

"Finally, we put up a rig and started drilling the first test well. And did we have trouble with that hole—cave-ins and every imaginable kind of mechanical trouble. Eventually we abandoned it and moved our rig to a new location—just two years ago tomorrow. About six months later we began drilling Pina No. 1; that was about ten miles up the Peninsula from here and it meant building more roads, setting up a new camp and stringing a telephone line from here at Amuguis to the new location.

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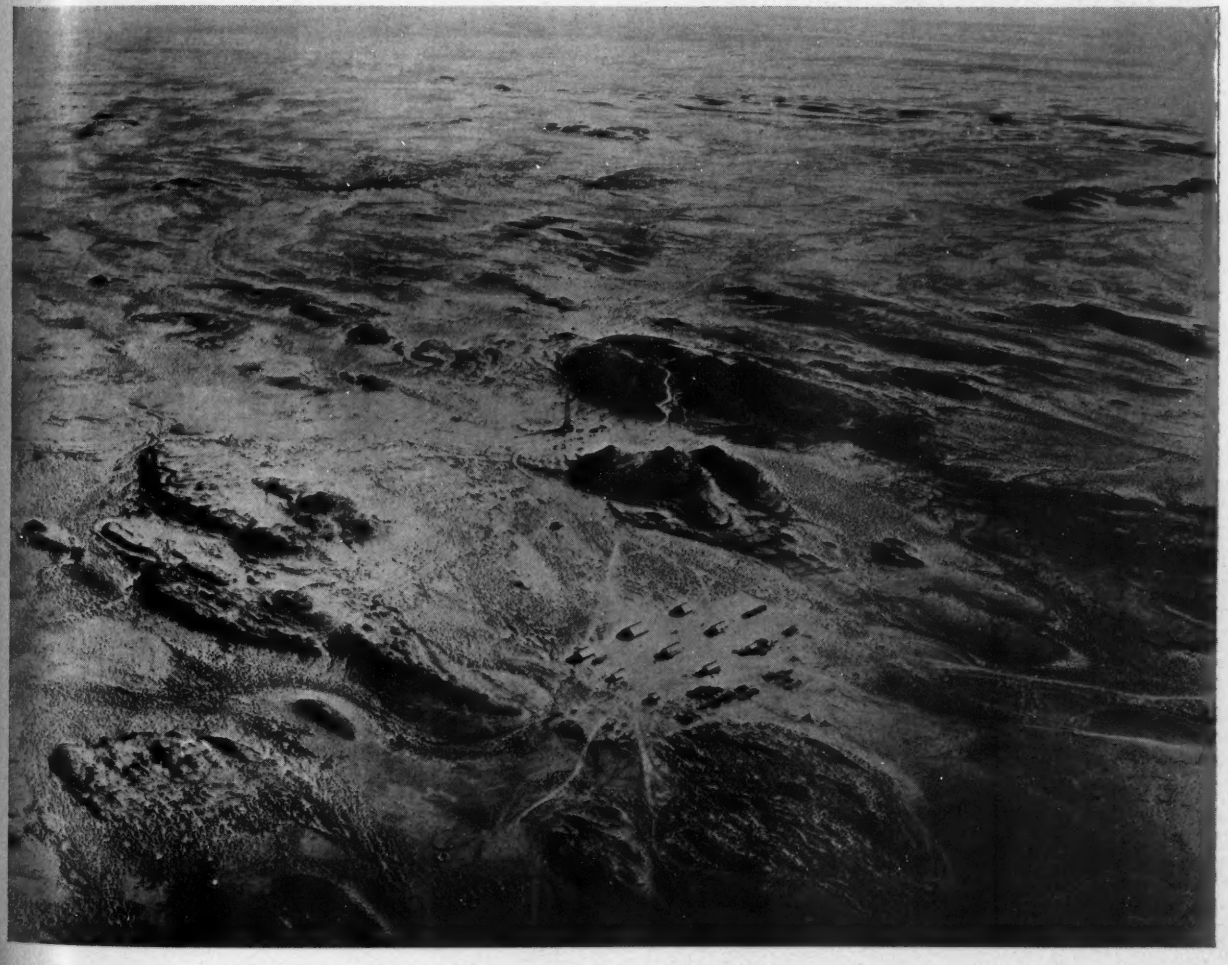
STEEL AND SAND AND ROUGH FORBIDDING DESERT, and deep below its surface Standard production men sink a wildcat well. That is the start of the story of Standard of California's now world-famous Dammam Dome field in eastern Saudi Arabia. The photographs below and left show the company's camp, in the heart of the scorching desert and, near-by, the discovery well, Jebel Dukan No. 1.



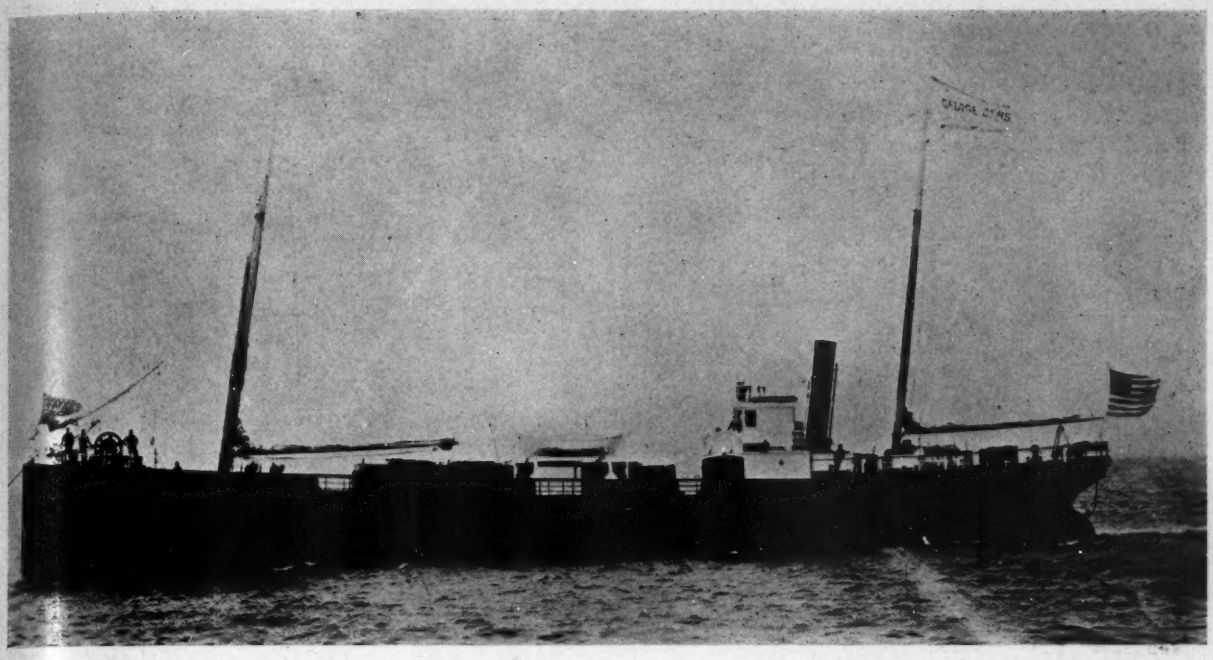
ON THE STANDARD TANKER F. H. HILLMAN, Chief Engineer Hillmor Smith watches the gauges as Third Assistant Joe Gerlach and First Assistant George McCallum shut off the two engines.

"You all know the rest of the story—we're nearly a mile down in the Pina and still no oil. The indications are here and San Francisco doesn't seem ready to give up trying while there's still a chance of getting some crude. And as long as they don't complain, we sure shouldn't.

"I don't want to give you fellows the wrong idea," Carl Newcomb concluded. "The work's been tough, sure; we've had some malaria and dengue fever and we've had our troubles like everybody else. But I've been here from the start and I can tell you one thing; we've never asked Bush Street for a thing that they haven't sent us—either for our work or our comfort. They've seen to it that we get down to Manila pretty regularly for a rest and a change, and all of us Standard fellows have been good friends since we first shipped out here. Just like I said, we've only had one thing to complain about—no oil—but maybe, if we're lucky, we'll get that tomorrow or the next day."

But Standard of California wasn't "lucky"; in five years of wildcatting on the Bondoc Peninsula of the Island of Luzon, the company failed to get commercial production. That is typical of the Standard Oil's other foreign ventures in the twenties. The stories of their exploration activities in Ecuador, Alaska, the Argentine, Mexico and Colombia might also be told but they would end the same—in "dusters," rotting derricks, and abandoned wells.

In all those remote places and during all those discouraging years, the Standard Oil Company never gave up trying. Obviously, if the wildcatting had been successful, both the company and the countries where the prospecting had been done would have benefited enormously. If not, there were always other places to go—like Bahrein, Saudi Arabia and Kettleman Hills.



THE GEORGE LOOMIS, Standard of California's first oil tanker, was the first steel carrier of oil on the Pacific Coast. It was constructed in 1888 by the Pacific Coast Oil Company, predecessor company to Standard in California.

And there is an even deeper significance to the Standard's endless search for oil. As the late Kenneth R. Kingsbury, then Standard Oil president, said when the Philippine Campaign was finally ended:

"The Bondoc adventure proves that there is something more to the oil industry than merely the manufacture and sale of petroleum products. Back of the gasoline pump there is a stupendous activity of which the public is little aware—an activity which leads to the end of the earth in a quest for new oil. The public hears much of successes, of wells gushing quantities of "black gold." Of the failures, of the great financial risks, of the great losses which often must be borne, it knows very little.

"Today the world moves on oil, and it is the obligation of those engaged in the industry never to permit the supply to fail. Hence our unceasing search for hidden deposits of petroleum."

### The Home Fires

So goes the history of the petroleum industry and of Standard Oil of California—a tragic ending one time, a happy one the next. While the company was meeting with failure on foreign soil, it was making great strides at home. In California, Standard production men discovered Wheeler Ridge and drilled successful wells in practically every major field in the state. In Texas, the California Company, a wholly-owned subsidiary, found oil in Mitchell County and in the famous Yates field, after seven years of prospecting during which more than a score of dry holes were drilled throughout an area covering 720,000 acres. These were not discovery wells, however.

Not only in producing, but in refining, transportation and sales, the Standard Oil Company of California made rapid strides during the 1919-1929 decade. The chart below gives a quick comparison of the company at the beginning and end of the period.

**Comparison of Standard Oil Co. of Calif. Operations—1919-1929**

| | Dec. 31, 1919 | Dec. 31, 1929 |
|---|---|---|
| Surplus | $ 58,117,167 | $ 253,389,103 |
| Crude Production (in bbls.) | 25,484,984 | 51,534,163 |
| No. Producing and Shut-in Wells | 411 | 3,449 |
| Properties Held in Fee or Under Lease or Contract (in acres) | Not available | 3,372,533 |
| Refinery Run (bbls. per day) | 111,600 | 157,660 |
| Tankers, River & Harbor Craft | 35 | 41 |
| Main and Sub-Stations | 400 | 657 |
| Service Stations | 218 | 553 |
| Employees | 16,359 | 19,952 |

Behind those statistics there are, of course, many stories of the progress that Standard Oil recorded during those ten years. There is, for instance, the story of the part Standard took in the advancement of aviation—of the erection and maintenance of giant airway beacons, of the publicity and support it gave the industry, of research and experimentation and special aviation products. There is the story of the Standard's Pasotex pipe line, stretching across nearly 200 miles of flat, brown sun-baked land—from Wink to the Standard-owned Pasotex refinery in El Paso. There is the

THE PLEASANT RECREATION ROOM, on the H. D. COLLIER, newest Standard of California tanker, is for the exclusive use of crew members during their off-duty hours at sea. This tanker and its sister ship, the W. H. BERG, set a new high standard in comfort as any sea-going Standard Oiler will tell you.

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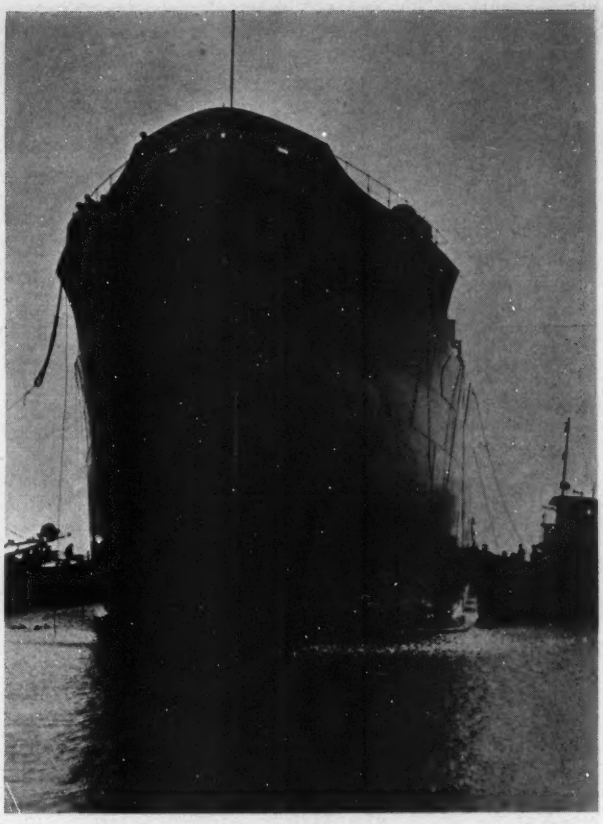
story of the Pacific Oil Company merger in 1926, a consolidation that brought to Standard many valuable holdings, including its 30,000 Kettleman Hills acres.

There are other stories of great achievement: The development of new products and new uses for petroleum by Standard Oil's great research laboratories—the part the company has played in bringing natural gas from Kettleman to the industrial centers of California —the development of new drilling and manufacturing equipment—the company's amazing safety record, its ever-growing fleet of tankers and its outstanding service station system.

All this is a record of progress—a continuing story of the increasing stature of a very great company that has grown from a single wooden derrick in Pico Canyon into a world-spanning, integrated oil corporation. But nowhere on the written record can you find more than passing mention of a characteristic that has made this growth possible. It is known as Standard Oil Spirit and it is simply taken for granted by every Standard Oiler—from roustabout to director. It is as old as the company itself and, as we have written, it runs as an identifying thread through the whole 60-year pattern of Standard of California.



THE SLEEK LINES OF THE W. H. BERG, big new Standard Oil tanker, are a far cry from the George Loomis, father of the great Standard of California fleet.

## CHAPTER IV.

### In the Bosom of the Family

IT IS 1919, and in thousands of cities around the world celebrating civilians line their Main Streets and joyously welcome home millions of war-weary soldiers: In a high-ceilinged, rococo room in the Palace of Versailles, frock-coated diplomats ponderously write the historic treaty that will officially close the "War to End War"; and at the German port of Scapa, on the North Sea, a beaten and bankrupt nation reluctantly sinks the remaining vessels of her war-time fleet.

Across the ocean in America, a stubborn Congress balks at America's entrance into the World Court: From Boston comes word that tight-lipped, humorless little Massachusetts Governor Calvin Coolidge has quietly and efficiently put down the bloody Police Strike. At Toledo, Ohio, a tough ex-hobo and shipyard-worker named Jack Dempsey knocks out flabby, overgrown Jess Willard to win the world's heavyweight crown.

All over the United States, bartenders regretfully hang up their aprons and bolt their saloon doors as the Prohibition Era of blind-pigs, speakeasies and bootleggers begins. The High-Cost-of-Living becomes a national lament and in 50 representative cities around the country gasoline sells for 25 cents a gallon plus tax. In fragile "jennies" and other strange-looking crates, barnstorming stunt-pilots hold flying-circuses around the country and sky-riding Americans suddenly become air-conscious: British Army officers John Alcock and Arthur Brown wing their way across the ocean in the first successful non-stop Atlantic hop; and the United States Army makes aerial history when 4 of its planes blaze the first air trail over the Great Divide, flying from Sacramento, California to Carson City, Nevada in an hour and a half.

In the over-crowded San Francisco building at 200 Bush Street that houses Standard of California's head office, 1919 is an eventful year. With a grave oil shortage approaching, Standard production men sound an encouraging note with new discoveries at Montebello and Elk Hills: In an area just south of Los Angeles, W. H. Berg, new manager of the Land and Leasing

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COMFORTABLE QUARTERS ARE THE RULE not the exception aboard Standard Oil tankers. This room, aboard the W. H. BERG, is typical of the quarters of this new addition to the Standard's fleet. No room is occupied by more than two men.

RAS TANARA, STANDARD OIL'S SHIPPING TERMINAL ON SAUDI ARABIA, is connected with the company's great desert field by a 43-mile pipe line. The picture above shows early construction on the pier and the concrete foundations of the terminal.

Department, secures a block of land for his company in a prospective oil district known vaguely as Santa Fe Springs: The entire oil industry mourns the passing of Colonel W. S. Rheem who, in 35 years, had come up through the ranks from laboratory assistant to president of the Standard Oil Company.

And in this year of restlessness and readjustment, 2400 Standard Oilers change from uniforms to "civies" and return to jobs their company has held open for them—glad and grateful to be back again in the bosom of their Family.

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A few years ago an editorial entitled "A Great Record of Industrial Peace—1879-1935" appeared in the Standard Oil Bulletin. In simple terms that editorial stated: "With two unimportant exceptions, no group of Standard Oil employees has ever struck for higher wages, or shorter hours, or better working conditions, or for any cause originating within the company. These are the exceptions to the company's strikeless record —28 years ago, half a hundred Richmond refinery workers walked out; within two weeks every man was back on the job. Twenty-one years ago, about 250 temporary pipe-line workers struck; that strike collapsed two weeks later."

There, essentially, is the story of labor disputes originating within the ranks of the vast and complex Standard Oil Company of California. That such a record can be written in less than a hundred words is amazing indeed—more amazing, even, are the reasons that lie behind the satisfaction of a group of men and women who have sometimes numbered more than 20,000 —a group of men and women who proudly call themselves members of the Standard Oil Family.

### The Forbears of the Family

To understand that remarkable record you have to know something of the company's relationship with its people—a relationship that began not in this labor-conscious age, but a quarter of a century and more ago. For the famous Standard Oil Spirit is not a product of today; it was born, as we shall presently see, in another era, in the days of D. G. Scofield, W. S. Rheem, K. R. Kingsbury, W. S. Miller, F. H. Hillman, R. J. Hanna, and H. M. Storey.

Those men were the Directors of Standard of California 25 years ago and, without exception, they had sprung from humble oil beginnings. Nearly 40 years before, Scofield had hauled timbers into rocky, forbid-

ding Pico Canyon to build an oil rig and drill the first commercially successful oil well in California. Rheem had entered the oil industry in 1885 as a technical employee of the Atlantic Refining Company; Miller had had his first experience with oil as a railroad conductor in the oil districts of Pennsylvania. Kingsbury had been a member of a pipe-line construction gang, Hillman an oil company messenger boy, Hanna a laboratory assistant in a Pennsylvania refinery, Storey an office boy for an oil transportation company.

Knowing something of the history of the men who were directing Standard of California's policies in 1914, you begin to understand the company's pioneering enterprise in employee-relationships. For each of these men had been through the mill; they knew, from actual experience, the wear and tear of a 12-hour day, the importance of good working conditions, of safety devices, of continuous employment, of job security and all the other things that go to make men happy in their jobs.

### Family Policies

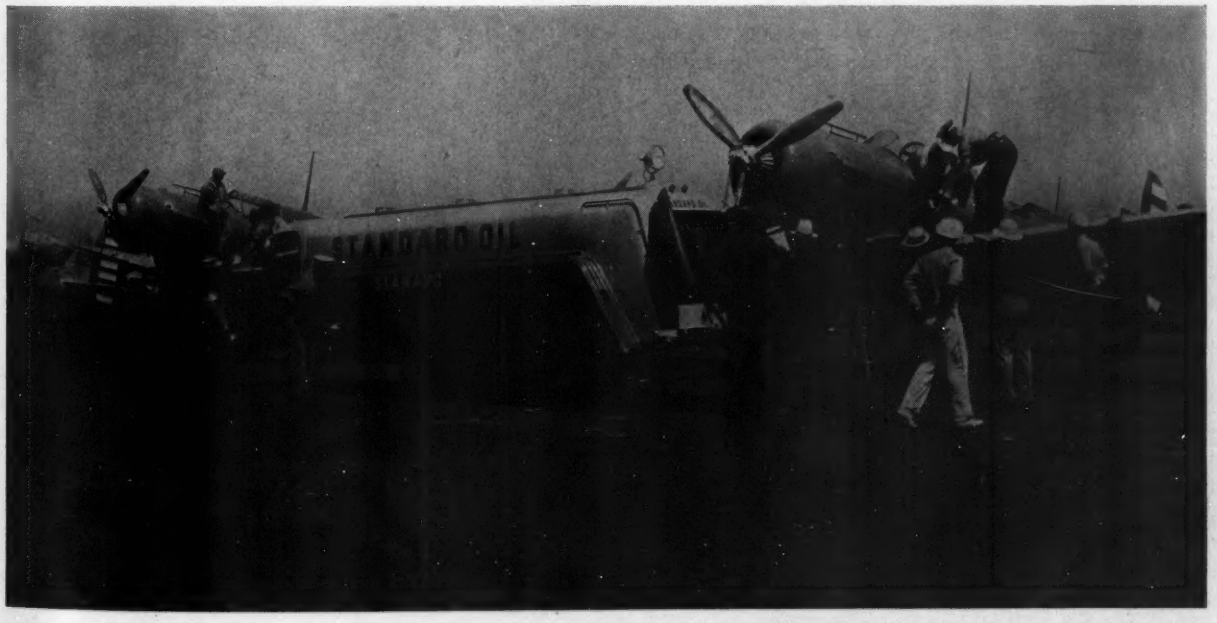
It is frequently charged that when men reach the heights in their particular business sphere they quickly forget the past and lose touch with their fellow workers. In the case of the Standard Oil Company of California, that charge is easily disproved.

First, there is the record; before the company turned the corner into the 'twenties, it had voluntarily put into practice employee-benefits which many modern industries are just now beginning to preach. That is surely proof that the seven Standard Oilers who were steering their company's course were remembering the past with vivid clarity.

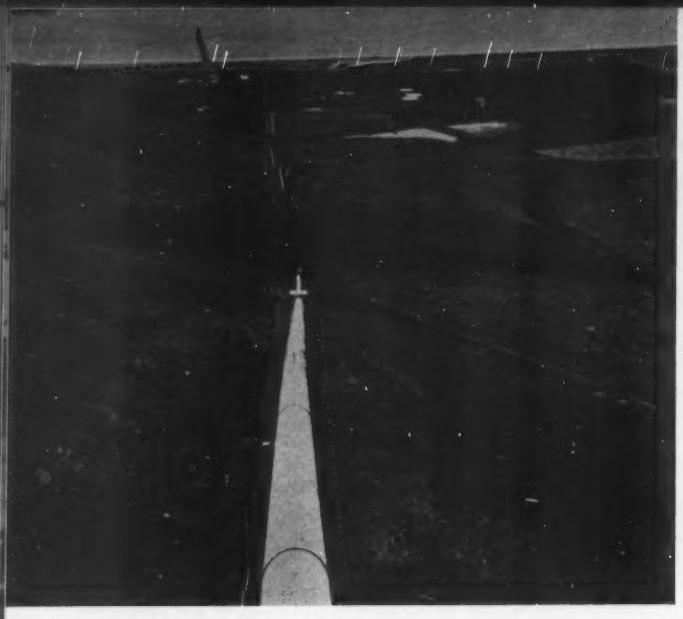
Then there are the men who were affected by those policies. In the preparation of this story, the California Oil World has not only examined the record as it was written more than a score of years ago; we have also talked to dozens of Standard men—in the fields and refineries, aboard tankers, in pump stations and offices and along the pipe lines. And from these and other men of the Family we have learned something of the reasons underlying Standard Oil's record of industrial peace.

Before turning to the stories these Standard Oilers tell, let's first look quickly at some of the employee policies that were adopted as long ago as 1919. There is, for instance, the 8-hour day; in the oil fields, the 12-hour day and 7-day week had been traditional. In 1917, Standard broke tradition and placed its entire production personnel on 8-hour shifts—at no reduction in pay. Sometime later, the company again ignored precedent and put its oil field workers on a 6-day week—again with no pay reduction.

Another Standard innovation, adopted in 1917, was the granting of two weeks vacation with pay to the common laborer. Shortly afterwards, the "daily wage" was abolished and the employees in all departments were paid monthly salaries. Other benefits were adopted during this same period; salaries were adjusted and maintained at generally higher levels than the prevailing wage scale. Insurance, pension, sickness and accident benefits affecting all employees were put into operation. The "Order of Service" was created by the Directors as a means of recognizing and rewarding extended service. Finally, the company maintained the highest standards of working and living conditions; a medical department and educational bureau were created; schools for the children of Standard Oilers were




AT ARMY FIELDS, AT CIVIC AND COMMERCIAL AIRPORTS, AT CLIPPER SEABASES, efficient Standard Oilers give quick service to pilots who fly their ships 'round the world.



THE ESTERO BAY PIPELINE, which Standard Oil built during the depths of depression. This four-million-dollar construction job was built eighteen months ahead of schedule and provided work for between 300 and 500 members of the Standard Oil Family.

established in isolated areas; the company's camps were models in the oil industry.

Out of these benefits grew a greater "Standard Oil Spirit" and a more unified Standard Oil Family. They had been adopted, not at the request or demand of a dissatisfied personnel, but as a voluntary move on the part of a sympathetic Board of Directors who had made it their business to understand and answer, where they could, the problems of the Joes and Jims and Bills of Standard Oil.

**Real Life Stories**

"It was a blistering July afternoon in 1915," Len Little, General Superintendent of Production in Standard Oil's Southern Division recalls, "and Mr. Hillman, who was the company's vice-president in charge of production, and I had been bumping over the Midway in an old Buick touring car since early morning. We were doing a lot of drilling then and Mr. Hillman was spending most of his time in the field, talking with the drilling crews and generally keeping in touch with everything that was going on.

"Every time we'd stop at a rig, Mr. Hillman would hop out of the car and walk over and talk with the men—shake hands with them, ask about their families and kids and pass the time of day. At just about every rig, one of the drillers would hand him a plug of tobacco. He'd take it, bite off a chew and, after we were under way again, he'd get rid of it.

"The same procedure went on all day and finally I said: 'Say, Fred, how come you always get rid of your chaw the minute we're out of sight of a rig?' Mr. Hillman replied with a kind of sheepish grin:

"'Well, Len, if you really want to know the darn stuff makes me sick as a dog, especially when it's so almighty hot.' When I asked him why in the world he kept on taking it, he said:

"'Shucks, it doesn't hurt me any—maybe makes me a little sick to my stomach for awhile. But the fellows around the field have been sharing their plugs with me for years and I just can't bring myself to turn 'em down. You know, Len, it might hurt their feelings if I said no or they might think I was getting uppity or something and I sure wouldn't want that to happen. Those fellows in the field know I'm one of them and I always want them to feel that way. And if the worst I get out of it is a belly-ache now and then I guess I can stand it.'"

And when you run across a yarn like that you know for certain that F. H. Hillman, Standard of California vice-president and Director, didn't lose touch with his fellow workers after he had won his way to a high place in his company.

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"When I hear people talking about honest-to-goodness human beings," Al Myhrs, retired Standard Oil Superintendent of Pipe Lines, recalled, "I always think of H. M. Storey. Why, I can remember when he was big boss of the Standard's pipe lines around Coalinga and he and his family lived for a whole year in an old 16 by 24-foot wooden construction shack—just so he could be close to the job. When I asked him why he didn't find himself a nice big house he replied: 'Al, the rest of the fellows in the outfit aren't complaining about living in tents, so why should we fuss about our place. After all, if they're content we certainly ought to be.'

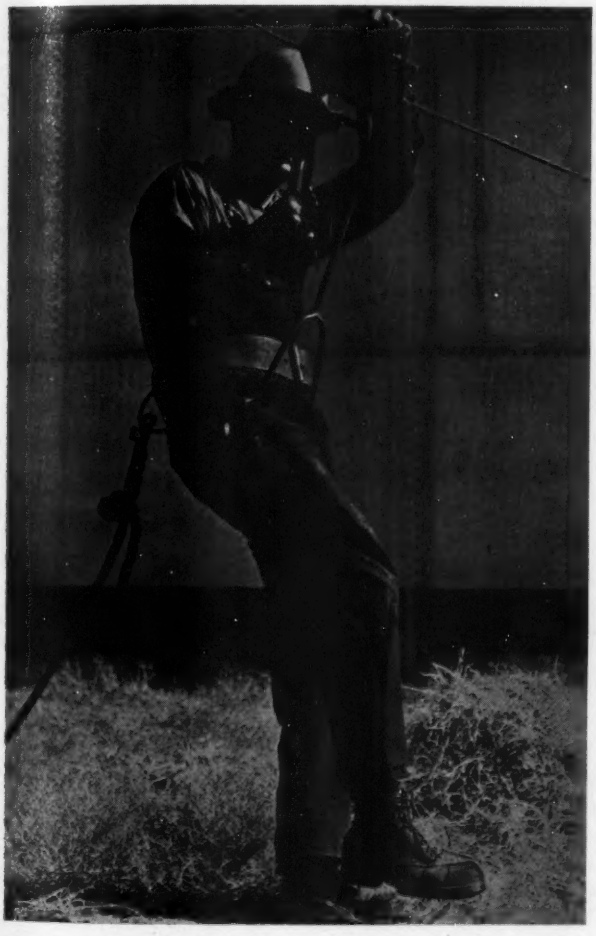
"But the thing I remember best about Mr. Storey was his consideration for the men on the job. He

THE BLACK TENTS OF THE BEDOUIN TRIBES form an interesting contrast to the modern homes of the Standard-designed, functional city of Dammam. Of course, Bedouin tents are a far more common sight in Saudi Arabia than air-conditioned cottages.

BUILDING A SUBMARINE PIPE LINE OUT INTO THE PERSIAN GULF, from Bahrein Island to the deep-channel of the Persian Gulf, took all the ingenuity and skill of Standard Oilers in a strange land.

made it a point to know a good deal about every fellow working for him, even after he became a Director of the company. Like one of the times back in 1914, when we'd spent all day Saturday riding over the line. We had only half finished the tour by sundown and I was figuring we'd bed down for the night and finish up Sunday. When I mentioned this, Mr. Storey replied:

"'Nothing doing, Al; you have a family you've been away from all week. They're planning on having you home with them tomorrow and that's where you're going to be, if I have to drive you there myself.'



ONE OF THE REASONS why the Standard Oil Company of California has such an enviable accident prevention record is that the company has continuously sought new devices to protect the members of its great Family. Above, Harry Davis, Well Puller, demonstrates a perfect "one-point" landing on a recently-developed Safety Slide. Two Standard Oilers developed it and the company is using it in the producing fields as an emergency exit for derrickmen who work alone high above the derrick floor.

"Naturally, I said 'nothing doing,'" Al Myhrs continued. "I told Mr. Storey that the rest of the line had to be covered and it was my job to do it. And he came right back with this:

"'Al, you're going home tonight and that's orders! I'll get somebody else who's had some time at home lately to finish the tour with me tomorrow. After all, it's part of **my** job to keep you fellows happy and that means keeping your families happy, too.'"

And when you find a man with that much consideration for a fellow-worker, you begin to understand why there is such a thing as "Standard Oil Spirit" and why Standard of California can proudly point to an almost unbroken record of sixty years of industrial peace.

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"I remember something funny that happened when we were building the Richmond plant back in 1901," John C. Freitas, tall, ruddy-complexioned Standard refinery-worker said. "Colonel Rheem was boss of the whole job and he was sure everywhere at once. A gang of us had just started to work for the Standard and we were all trying to make an impression. Well, one day we saw Mr. Rheem headed our way and we thought we'd show him we were the best construction gang of the whole she-bang. We were really laying to it when he came up to us with a twinkle in his eye and shouted:

"'Hey, boys, take it easy; if you kept that pace up for an hour you'd drop in your tracks. You're not fooling me or anybody else—I'm a working man myself and I know what another working man can do and what he can't. And remember this, boys—the Standard'll never expect more from you than an honest day's work—just do that and you'll never hear a word of criticism from me or any other boss you may have in this company.'

"And with that," John Freitas continued, "the Colonel grabbed up a piece of pipe, hoisted it to his shoulder and started slowly up the hill, calling to us: 'You fellows bring the rest of that stuff and don't any of you pass me unless you want to make me feel like a doddering old man.'

"In the 38 years I've worked for the Standard," John Freitas concluded, "I've seen that sort of thing happen many times—everybody on the same plane—a sort of friendly, family feeling that people don't expect to find in a big outfit like ours. I guess that's because the fellows at the top were once at the bottom and they have good memories.

AIR-CONDITIONED COTTAGES, like those built by Standard of California for its oil workers in the city of Dammam, in Saudi Arabia, are a novel innovation on the desert. The photograph above gives an idea of the spaciousness and modern comfort of the cottages.

Colonel Rheem was just as close to us when he was President as he was when he was bossing the construction job at the refinery. And he was no exception; Dick Hanna worked here in the yard as a boy and he's still one of us. So is Mr. Russell, another of the Directors. Why, we were next-door neighbors here in Richmond when he was on the pipe gang about 25 years ago and we're still great friends.

"Ordinary, everyday Standard Oilers like myself know those fellows are more than Directors of the company. They're old friends and from the things they've done for the employees we know they haven't forgotten the days when we all worked side-by-side. I can tell you that if all outfits were as good to their people as the Standard is, the worker wouldn't have a worry in the world."

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These stories have been set down just as they were told; they are typical of dozens of others we have listened to. All of them serve to illustrate one point, which is this: Perhaps the most significant pioneering achievement in Standard of California's whole long history has been in the field of employee-relationships. Certainly, the company was a full two decades before its time; certainly modern industrialists accord employee-relations a high place in the present scheme of things. And if you would like to know whether it's all worthwhile, you can find the answer in the record of the Standard Oil Company of California—a record of steady and sometimes spectacular growth through sixty years—an almost unmarred record of industrial peace—over 18,000 employees whose jobs and futures are secure and who, for the most part, will tell you that you'd have to travel a long road before you'd find a better outfit to work for than the Standard.

### A Decade of Progress

The period from 1909 to 1919 was one of spectacular expansion for the Standard Oil Company of California. It was during this decade that gasoline, for the first time, outstripped kerosene in sales. Standard, aware of the transition in their industry, was quick to take advantage of its sales opportunities. In 1914, the company purchased the 31 service stations of the National Supply Company and established its first direct contact with a motoring public that was soon to recognize the red-white-and-blue of Standard as a symbol of courtesy and service. By the end of the ten-year period, Standard service stations formed a chain of 218 links that extended along the Pacific Coast from the Mexican to the Canadian border.

It was during this same era that the Midway-Sunset field became the state's most important source of oil, reaching its peak of production in 1914 with a total yield of 50,000,000 barrels. Standard kept pace with the California industry's steadily increasing production—during the period the company's production from its own wells increased nearly ten-fold, from approximately 7,000 to 70,000 barrels of petroleum a day.

In 1911, Standard of California took an important step in manufacturing. The company's Richmond refinery was the largest and most complete in the west but it was a long way from the Pacific Coast's second market—the fast-growing city of Los Angeles. To Standard Oil that, apparently, was enough to justify the building of a second refinery; subsequent events, of course, proved how right the company had been. For in the decade that followed the ground-breaking at El Segundo, Los Angeles became the largest city on the Pacific Coast, its port became the greatest petroleum shipping point in the world and the Los Angeles Basin fields became the most important source of oil in America.

### A New Family Home

On a crisp autumn morning in November, 1913, a neatly-dressed young Los Angeles business man stepped down from a Pacific Electric car at a little wooden station marked El Segundo. His name was Ralph Converse and he had come out from the city on this particular morning to look at a drug store that a friend of his had said might prove a good buy.

As Converse walked briskly along a rough board walk that led over the sand dunes toward the Pacific Ocean, he wondered if this might be someone's idea of a joke. He had been told that there was lots of industrial activity in El Segundo and now all he saw was ocean and sand and a few stray cows. To be sure, he had passed several farm houses during the last few miles of his ride, but that didn't seem to indicate the need for a drug store.

Suddenly, as he reached the crest of a hill, he saw below him the industrial activity his friend had de-

scribed. It was Standard of California's El Segundo refinery and he knew at a glance that here was something permanent; substantially built, impressive in size, active and prosperous-looking.

As Converse stood on the hilltop, he noticed another man trudging up the dusty road that led from the refinery to the railway station. When the other man reached the crest, Ralph Converse spoke up:

"Good morning, sir; I wonder if you'd mind giving me a little information about the refinery down there?" As the other man nodded and introduced himself as Mr. Fitzgerald of Standard Oil Company, Converse continued:

"I'm a stranger here and I'm thinking about buying a drug store in town. Naturally, I'd like to know how many people Standard Oil employs here, how big the plant is and what it's future looks like. And I'd also like to know a little something about the town of El Segundo."

"Well," Fitzgerald replied, "the Standard has about 200 people on its payroll right now. The first oil ran into the stills only two years ago, so they're hardly more than started. But they've already made a few additions and from what I hear they are getting ready to expand some more. Right now it's a mighty complete refinery and it can handle a good many thousand barrels of crude a day. As to its future—I'd say it was good. As you'll find out if you settle here, the Standard doesn't do anything half-way and this refinery is no exception. It's built to last and if they keep on going the way they have been lately, it will be one of the biggest refineries in California before so very long.

"Now the town's something else again," Fitzgerald continued. "It's really not much more than a bunch of shacks next to the plant—there's a bank, a drug store, which I guess is the one you're thinking of buying, a couple of restaurants, a grocery store and an old hotel or two. But if I were you, young fellow, I wouldn't worry too much about that. The company has already taken a big interest in El Segundo and as the refinery grows, which you can bet it will, the town is sure to grow with it. And if you knew as much about Standard as I do, you'd know that the company will see to it that the town grows along the right lines."

If Fitzgerald had had a crystal ball and second sight, he couldn't have predicted the future of the refinery and the city of El Segundo with more amazing accuracy. Ralph Converse, who is now one of El Segundo's principal business men, tells the story of the years that followed briefly:

"Before I left town that day," Converse says, "I'd bought myself the drug store in that tiny Southern California beach town. Four days later I was behind the counter and during the first month I took in about $200. That was pretty discouraging but it didn't last long—my business has increased year-by-year and now it's a poor month when I don't gross more than $3,000. Just like Fitzgerald told me that day 26 years ago—the Standard's El Segundo refinery has never stopped growing and the city and my business have both grown with it.

"Naturally, I've always been close to the Standard Oil Company," Converse adds. "Better than 75 percent of my business comes from Standard families. And, as an outsider, I know what the company has done for this community. Today, it's a model town of better than 3,000 population; we haven't a nickel's worth of indebtedness; we own our own water works and sewer system; we have fine parks, wide paved streets and excellent schools. The Standard Oil Company made most of this possible—why, because of Standard taxes, we have a high school that's rated one of the best in the whole state. Of course, the company doesn't claim any of the credit for building El Segundo from a barley field into a spick-and-span, up-to-date city."

"That's why I've always said," Ralph Converse concluded, "that the Standard Oil Company of California did a good deal more than build a vast 100,000 barrel-capacity refinery here at El Segundo."

And that, coming from an outsider who knows every last detail of a story that has been more than a quarter of a century in the telling, is an outstanding tribute indeed.

## CHAPTER V.

### Friends of the Family

IT IS 1909 and in America and Europe, aviation captures the imagination of a once-scornful public when a few courageous flyers perform "impossible" feats in flimsy flying-machines. In the United States, the Wright brothers astound credulous officers of the Army's Signal Corps by flying their box-like biplane at the amazing speed of 40 miles an hour. On the shores of the English Channel, a thrilled crowd holds its breath as Frenchman Louis Bleriot flies across the narrow channel and lands his plane safely on British soil. And in Berlin,

STANDARD OIL PICNICS are important events in the lives of members of the great Standard Oil Family. This picture, taken in the summer of 1938 at El Tejon Grove in the San Joaquin, was attended by 4,000 people, all Standard Oilers and their families.

ON ANY SUMMER SUNDAY, you'll always find a crowd of Standard Oilers in the big cool swimming pool at the Standard's Richmond Rod and Gun Club. This recreation and sport center was organized for the Standard Family approximately a quarter of a century ago; one of the founders was Dick Hanna, company vice-president and director.

proud Germans watch a giant silver "sausage" called a Zeppelin circle their city for 34 continuous hours.

In Washington, D. C., Congress passes a law prohibiting the importation and smoking of opium and adopts the Income Tax Act as the 16th amendment to the Constitution; as a blustery March wind sweeps torrents of rain down Pennsylvania Avenue, a huge, white-mustached man named William Howard Taft solemnly takes the Oath of Office as 27th President of the United States; and from army headquarters, the chief-of-staff at last orders American troops out of Cuba, ending a ten-year military occupancy.

Elsewhere on the American continent, other names and events made exciting news. Dr. Cook and Commander Peary begin a life-long feud with their claims to discovery of the North Pole; Glenn Curtis wins the first International Air Race, flying 12½ miles in 16 minutes; a visionary inventor named Lee De Forest applies for patents on a strange contraption he calls a radio.

And as 312,000 automobiles chug slowly along the rough and rutted wagon roads of America, alert, far-seeing Standard Oil Company of California makes new friends along the highways of the West in preparation for the epochal change in transportation that it believes lies just ahead.

### Setting the Stage

As the oil industry of California turned the corner into the twentieth century, it had two undisputed leaders. In the fields of producing and refining, the Pacific Coast Oil Company stood well above the crowd; it was producing oil in Ventura County and owned promising lands in the state's new fields; its extensive refinery at Alameda Point was running to capacity and the company was considering the construction of a new and much larger plant. In the field of marketing, the Standard Oil Company was far in front; for ten years, it had sold the entire output of Pacific Coast Oil's refinery and it was acknowledged as the leading western marketer of a long list of eastern products.

It was only natural that these two leaders should eventually consolidate and, as most oil men of the time had long expected, Standard acquired Pacific Coast Oil by stock purchase in 1900. That event, which brought Standard to the fore in all phases of the petroleum industry, signalled a new expansion program that was to surpass anything the California oil industry had yet seen.

By 1903, Standard in California had further solidified its position of dominance: At Richmond, it had completed the greatest refinery on the Pacific Coast and one of the largest in the United States; that year, 3,317,000 barrels of crude were run through the refinery's 19 modern and efficient stills. A large part of that oil had been pumped through the company's newly-completed pipe-line that stretched for 280 miles from the heavily-producing Coalinga and Kern River fields to the Richmond plant. Meanwhile, in the interests of more efficient operation and a constant flow of oil, the company had constructed the first tank farm in California, building 25 steel storage tanks on the San Pablo hills back of Richmond.

Finally, in 1907, Standard turned its attention to its weakest link. Up to then, the company had been principally interested in transporting and refining oil and marketing petroleum products. Developing major production of its own was the last step toward complete integration. A Production Department was established, leases in all promising fields were acquired and an intensive drilling campaign was begun. The new policy bore immediate fruit and, in the first year after it became effective, Standard wells produced nearly 800,000 barrels of crude.

### New Friends

While Standard in California thus moved forward in its newly-chosen fields, the company began to seek new friends for its increased production—in sparsely-settled outposts of the west, in the other markets of the Pacific Basin, in Alaska, in Mexico, and in Central and South America.

Reaching out into those markets in that distant day was far more difficult than the problem would be in this fast-moving age. It took courage and vision; most of all it took ingenious men who could endure hardships and who could talk an incredible number of industrial languages.

But as the whole history of Standard bears out, the company has never lacked courage or vision or good men. And the stories that we have set down here indicate clearly that the company pioneered still another field that so far has escaped mention. That field is what modern industry knows as "public-relations" but which Standard Oilers have long called "just good sound selling and plenty of service."

## Short Short Stories

"Selling the Nevada gold mine operators in the hectic boom days of the 'nineties took a lot of courage," Horatio T. Harper, retired Standard Oil Vice President told the California Oil World. "But they needed gasoline to run the machinery, candles for the shafts and water-white to light the bunk houses and they needed it all in a hurry. There wasn't any way or any time to check up—if we didn't ship immediately, large crews of men would be idle. The Standard knew those orders were urgent; we decided to ship first and ask questions after, and we never regretted it. For years, mining men told Standard salesmen how much they appreciated our seeing them through. So it certainly paid us to take the attitude that most people are honest after all—actually we took almost no credit losses and we made a host of new friends that have been loyal to us ever since."

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"When I first went out selling for the Standard, about 30 years ago," R. S. Milligan, Assistant District Sales Manager of the San Francisco District, recalled, "an oil salesman certainly had to be a jack-of-all trades. One of our stock arguments was "Standard had something to sell to everybody" and it was just about true. We sold floor-oil to barber shops, candles to mining companies, oil and skid-grease to lumber mills, harness and hoof-oil to livery stables, machine oil to canneries, kerosene, lamps, lanterns, stoves, heaters, wicks and dozens of other items to hardware and general merchandise stores and gasoline and lubricating oils to garages and bicycle shops. In fact, we sold all the petroleum products plus every conceivable kind of oil-consuming device.

"I worked out of the Sacramento agency and covered the mountain territory—and when I say covered, I mean I called on every store, business house, mill and mine in the whole country. You see, we had orders from headquarters that no account was too small for the Standard to service—and, believe me, we gave 'em service. Many's the mine shaft I've been down testing out our different candles for a prospect or a customer. And we had to know machinery, too, so that we could recommend the proper lubricating oils and greases.

"And because we didn't discriminate, and gave a world of service to every customer, regardless of size, we made plenty of friends who are big Standard customers today."

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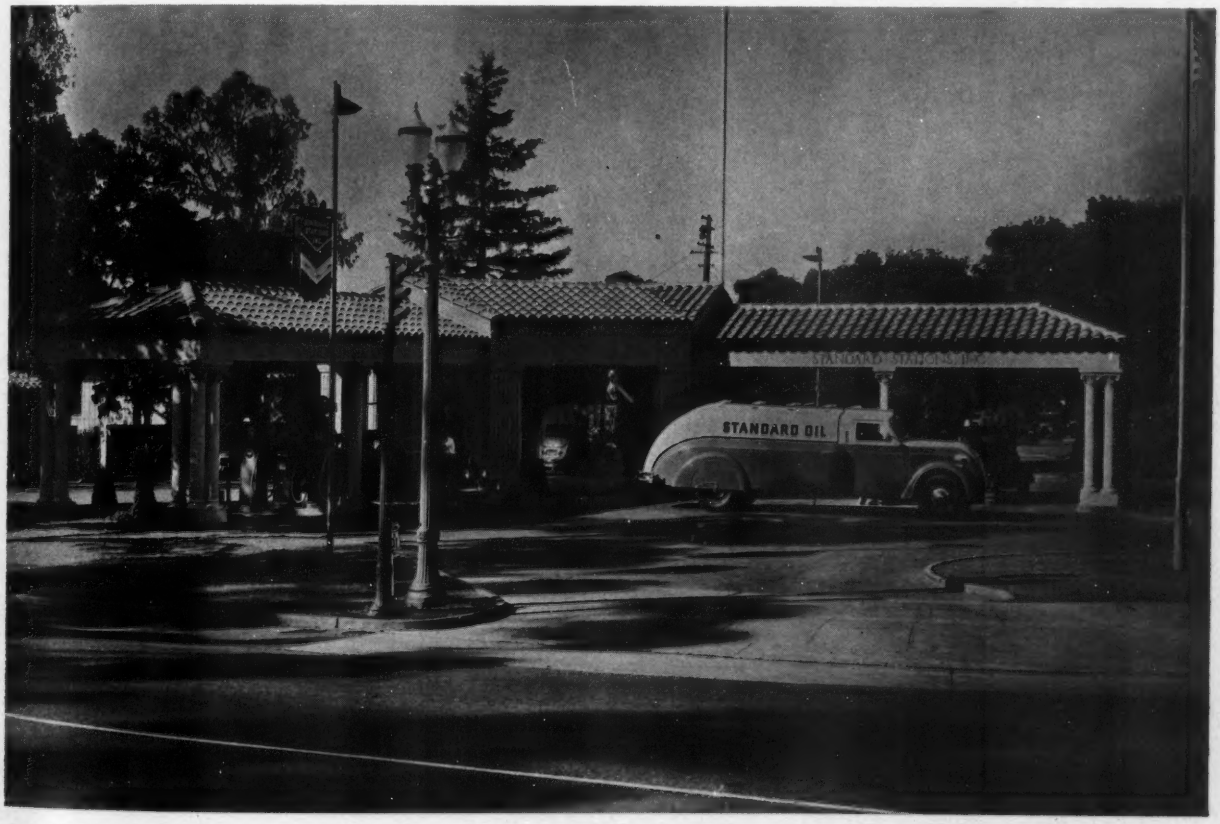
"The Standard never let any grass grow under its feet when it came to service," G. H. Richardson, retired Manager of the Lubricating Department said. "In 1909, I was sent down to Honolulu as assistant Special Agent. Travelling conditions in the Islands were bad then; it




THERE'S A KINSHIP between this beautiful landscaped Standard Oil Station and the impressive sandstone buildings of the near-by Stanford University campus, at Palo Alto, California. It has long been a Standard of California policy to design stations in conformance with the surrounding architecture.

was wild country, the roads were poor and there were practically no decent hotels outside of Honolulu. As a result most salesmen sat in their offices and waited for business to come in. But not the Standard; I hadn't been there a week before I started out on my first trip—a complete tour of the plantations on Maui, Oahu, Lanai and Hawaii. I did so much business and made so many friends that after that I made the trip, in a horse-drawn buggy, of course, every 30 days.

"Down there," Mr. Richardson continued, "it was out-and-out sales pioneering—helping to solve tricky problems for the plantation owners; trying different products in our line until I found the one that worked best. It certainly paid; the buyers all appreciated the extra services we were rendering and they leaned over backwards to give us their business. And another thing, the Standard stood behind its merchandise 100 percent, just like it does today; and there's nothing in the world that makes better friends for a company than a policy like that.

"Sure, we had to endure hardships in those early days," G. H. Richardson concluded, "but we were continually pioneering new territory and the hardships were a part of the job. Good merchandise and good service was the best way we knew to get business. If it meant riding horseback along icy roads banked with snow, as it frequently did when I covered the northwest territory years ago, or sleeping on the ground, which all the old-timers have done plenty of times, we did it. But we got the business and made real and lasting friends for the Standard to boot."

*

Over at Point Reyes Station, across the bay from San Francisco, there is a big brick general-merchandise store that sits prominently on the main street of the town. It is called the Grandi Mercantile Co., and its proprietor, Reno Grandi, is known all over Marin County. For he is more than just a big merchant; he serves on the local school board; he is president of high school district Board of Trustees; he owns a large garage and operates 4 ranches nearby. He told the California Oil World something of his family's experiences with the Standard Oil Company of California.

"I guess the Grandi's have been buying Standard products for nearly 55 years," Reno said. "I remember playing with Standard coal oil cans when I was just a shaver and that's a long time ago. When I first started working in the store as a part-time clerk, my uncle said to me:

" 'Reno, you see that shelf-full of Standard Oil stuff. Well, you don't have to hesitate recommending it; it's the best line of petroleum products that's sold and the company that makes it is as solid as a rock. They'll stand behind every dollar's worth of goods they sell and you can bet on it!"

"Naturally," Reno Grandi added, "in the years I've sold Standard Oil merchandise, I've had some complaints from customers. And I've come to find out that what my uncle told me was gospel truth; the Standard never quibbled about backing up its goods.

"Of course I've seen lots of changes in 30 years or so. The first Standard salesman that ever sold me had a little white goatee and came in a horse and buggy. In those days, the principal items in the line were Pearl Oil, Elaine Coal-oil, Eosene Coal-oil, Mica axle grease, Eureka Harness Oil, Radiant candles and a line of lamps and stoves. We'd buy our kerosene in 500 gallon lots and what little gasoline we ordered came in 50 gallon drums. They had a little faucet and we'd fill buckets from that and pour the gas into auto tanks through a chamois filter.

"People sometimes wonder why we've never switched from Standard," Reno finished. "Here's why, in a nutshell. The company has always been fair and reliable; in all the 55 years we've done business together, the Standard has never once tried to put over a fast deal. Their products are as good as you can buy; I know because between the store, the ranches and the garage, we've used most of them ourselves. We've never had a complaint about service, and the company has always given us just about everything we asked for. It seems to me the Standard Oil Company has earned our loyalty and deserves our business—and they're going to keep on getting it."

*

George Hart is President of Farnsworth & Ruggles, the oldest and one of the largest drayage firms on the Pacific Coast. For 47 years he has been doing business with the Standard Oil Company of California on both the buying and selling side. When he talks about the Standard he speaks from experience:

"I did business with W. S. Miller, who later became Chairman of Standard of California's Board of Directors, when the company used to bring some of its eastern goods around the horn in sailing ships," George Hart said. "And as long as I can remember the Standard has played straight down the alley, whether they were buying *from* you or selling *to* you.

"Here's an experience I had with the company that I'll never forget. We'd stacked up some case goods of theirs before making delivery and a sudden rain storm came and soaked the whole lot of them through—the labels were ruined and the goods had to be all re-cased. I immediately went down to Standard's one-room office and told Mr. Miller what happened, explaining that I felt responsible and that, of course, we'd make it good. Mr. Miller shook his head and said to me:

" 'Why, you fellows can't be held responsible for Acts of God and that's certainly what that shower was. You just go on about your business, George, and forget it. The Standard will stand the cost of fixing up those cases.'

"And that story's typical of the kind of treatment we've always had from the Standard. Naturally we have a friendly feeling for a company that shoots that square. And being good friends for so many years,

we buy every dollar's worth of petroleum products we use in our trucks and cars from Standard of California."

*

When you hear stories like that, you know that the Standard Oil Company of California has a true understanding of what modern industrialists call "public-relations." Add to that the fact that Standard has kept its friends through the years and has never once relinquished its place of leadership during six decades of marketing petroleum and you are sure to conclude, as we have, that its attitude toward the public forms one of the basic reasons why Standard's has been a story of uninterrupted progress from its inception until today.

## CHAPTER VI.

### The Roots of the Family Tree

IT IS 1889 and throughout western America settlers live in constant fear of harrowing Indian raids; after a bitter fight, the Sioux cede 11,000,000 of their Dakota acres to the United States; and from across the nation, hundreds of adventurous men and women race madly for Oklahoma as the Cherokee Strip is opened for settlement.

In Brazil, fiery Latin Americans drive Emperor Pedro II from his throne and joyously declare their country a republic; near Yonkers, New York, hilarious crowds followed four strangely dressed men knocking little white balls around America's first golf course; and in Austria-Hungary, the suicide of Crown Prince Rudolph starts furious tongue-wagging in the capitals of Europe.

In 1889, four new states are admitted to the Union; John L. Sullivan, the Boston Strong Boy, batters Jake Kilrain into submission after 75 rounds of bloody bare-knuckle fighting; dainty Maude Adams scores her first Broadway triumph in the leading role of "All the Comforts of Home"; and in Conemaugh Valley of Pennsylvania, America suffers the worst disaster in her history when a bursting dam unleashes a raging wall of water that destroys Johnstown and snuffs out 2,300 lives.

In the oil industry, Texas makes its modest bow onto the petroleum scene with a total production of 500 barrels of crude for the year; Colorado boastfully announces that her oil production has exceeded California's by some 13,000 barrels; and in San Francisco, the Pacific Coast Oil Company's tenth birthday celebration is somewhat dampened by the disheartening realization that production from the state's only field has dropped from six hundred thousand to three hundred thousand barrels during the year.

*

To be sure, 1889 was an inauspicious year for the California petroleum industry if you compared it with the two preceding years. But it was no strain on the memory of D. G. Scofield, who stood at the helm of the ten-year-old Pacific Coast Oil Company, to recall far less abundant years than this. For he could remember when that broad black stream was a mere trickle from a 30-foot hole in the mountain wilderness of Pico Canyon; and when California was without a single flowing oil well, a refinery or a pipe line. Furthermore, he could distinctly remember when San Francisco business men would glare in stony silence at any man who dared mention the word "oil."

It had been D. G. Scofield who had changed all this—and in the incredibly short space of a decade. It was he who planted the seed of the tree whose roots were to take firm hold in California earth and whose branches were one day to spread out around the world. To understand how Standard of California's Family Tree grew to such proportions you must first know something of the man who brought it into being. It is our purpose, therefore, to briefly review the story of Standard Oil Company's predecessor in California—which can only be told in terms of its founder, D. G. Scofield.

### The Father of the Family

It was in 1876 that a bronzed, mild-mannered young man waited quietly in the anteroom of the office of the Mayor of San Francisco. After what seemed an interminable time a door opened and a booming voice called out:

"Mayor Bryant will see you now, Mr. Scofield."

Inside his private office, the mayor beckoned his visitor to a chair, rustled through some papers and finally said:

"Well, young man, what can I do for you?"

In his anxiety to make an impression on the Mayor of the Pacific Coast's only big city, Scofield had long before planned his speech carefully. Now, the words came tumbling out:

"Mr. Bryant, I want you to help me form a company to develop some prospective oil land I have found in Ventura County and before you answer I want you to hear me out. I was born and raised in Pennsylvania, just a few miles from Colonel Drake's famous Titusville discovery well. I am an oil geologist of some experience and I know there is oil in California.

"When I first came to San Francisco," Scofield rushed on, "and started a small kerosene distributing business, I heard tales of the oil seepages in the mountains near Newhall. The first chance I had, I went down there to see them for myself. I tramped through the mountains; studied the surface geology and examined the seepages. I'm more convinced than ever and I want to drill a well at the head of a rocky gorge the natives down there call Minnie-Lottie Canyon. That area deserves a thorough test and, one way or another, I'm determined to see that it gets one. It's going to take some financing, Mr. Bryant, but I'm certain that if you and some of your friends can see your way clear, you won't regret it."

Young Scofield's earnestness and enthusiasm coupled with his experience impressed Mayor Bryant. A short

time later he advised the jubilant geologist that he and a group of business men, which included Charles N. Felton and George Loomis, who were to become Pacific Coast Oil's first and second presidents, were forming the California Star Oil Works to finance the venture.

The rest is history; D. G. Scofield and a brawny Los Angeles carpenter named Alex Mentry, using the primitive spring-pole method, struck oil 30 feet below the rocky surface of the canyon after a month's wearying labor. The daily production of their first well was 2 barrels of 32° gravity crude; their second well yielded another 2 barrels a day; the third one was a dry hole. Then came Standard's famous Pico No. 4; that was drilled to the prodigious depth of 600 feet and from there oil flowed at the rate of 150 barrels a day.

But finding oil was only one of the obstacles Scofield had to hurdle. That oil had to be transported and refined; more money was needed and Scofield journeyed to San Francisco and laid the problem squarely before his associates. Again his enthusiasm and confidence prevailed and, on Sept. 9, 1879, the Pacific Coast Oil Co. was incorporated and capitalized at $1,000,000. Thus, Standard of California's predecessor was born; and it is from that beginning, just 60 years ago, that the present Standard Oil Company traces its corporate line.

In the ten-years that followed, the Pacific Coast Oil Company became the dominant leader in the California oil industry. Property was acquired in Wiley Canyon, a few miles from the discovery area, and new wells were brought in. From an initial yearly production of 12,000 barrels of oil the district's yield climbed gradually until, by 1888, it reached the respectable total of 690,000 barrels of crude.

While production was progressing, a two-inch pipe line was built from the field to a station on the newly-completed Southern Pacific Railway. At Alameda Point, on San Francisco Bay, an extensive refinery was constructed and before the decade closed, the products of the Pacific Coast Oil Company's wells and plant were finding a market in such distant places as the Sandwich Islands, British Columbia and Mexico.

Then, in 1890, Pacific Coast Oil, efficient producer, transporter and refiner of petroleum, made a significant and far-reaching alliance. Six years before, Standard Oil Company had come West and was already acknowledged as the leading petroleum marketer on the Pacific Coast. And, as we have seen, these two young companies joined hands and, inevitably, grew into one of the truly great corporate families of America—the globe-girdling Standard Oil Company of California.

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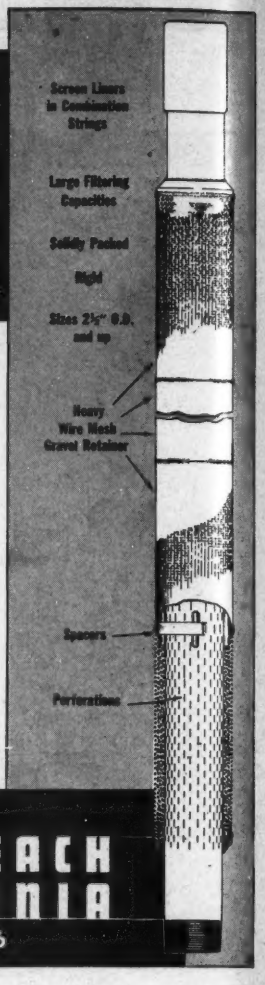


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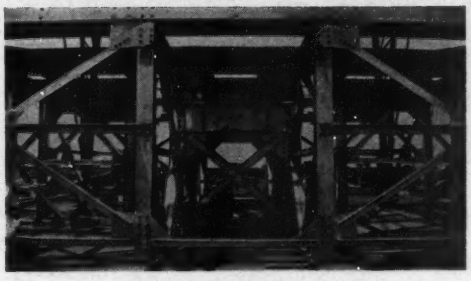

*Looking through a "High Floor" Substructure at Rio Bravo, California.*

*"M-M" 150-ft. Steel Derrick with 32-ft. Base and 8-ft. Substructure.*

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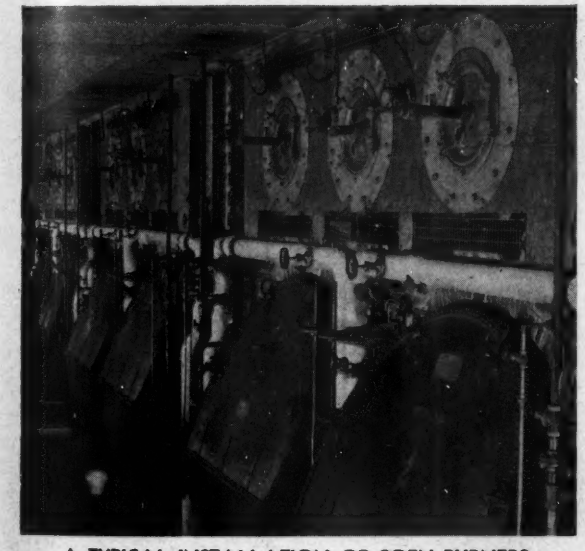

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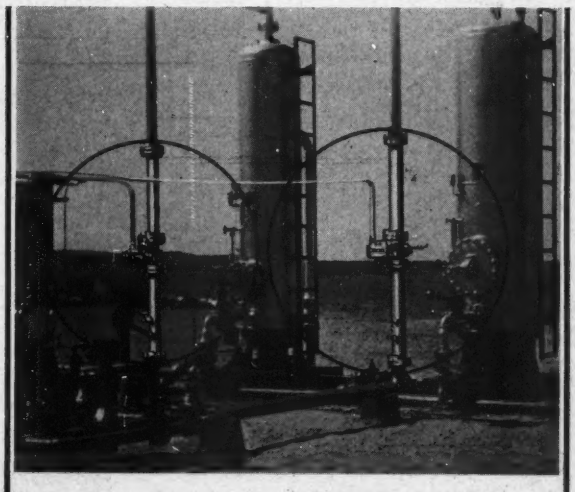

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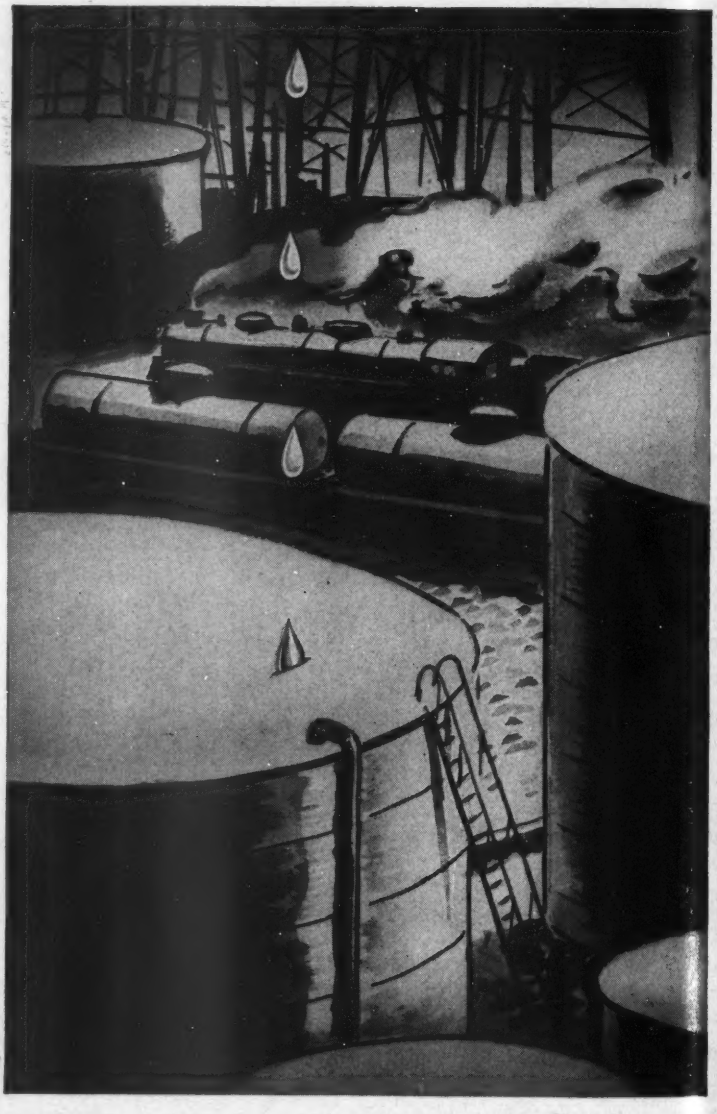

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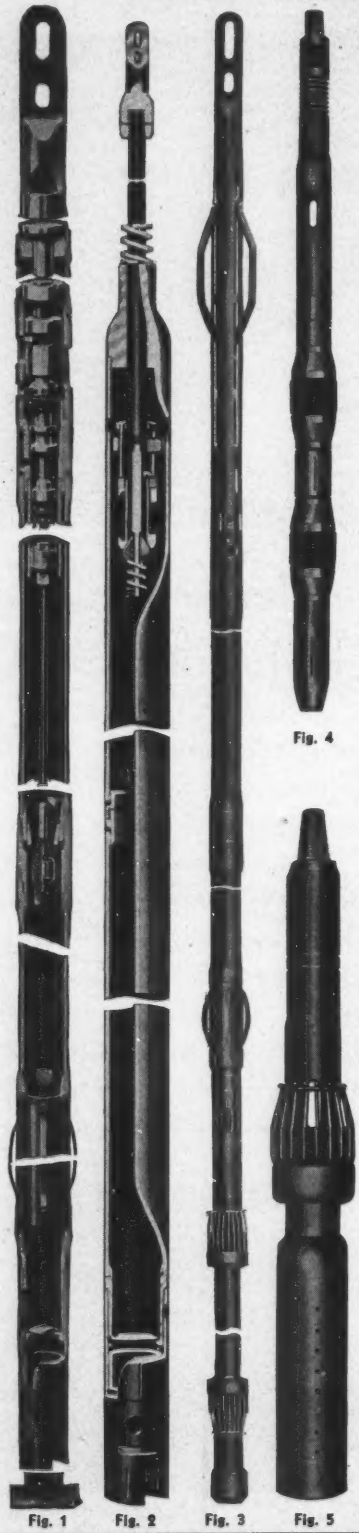

Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5

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Fig. 1

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Fig. 2

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### CAVINS PERFORATION WASHER

Fig. 3

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Fig. 4

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Fig. 5

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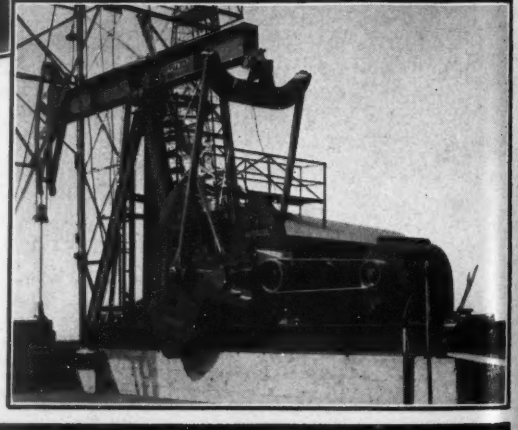

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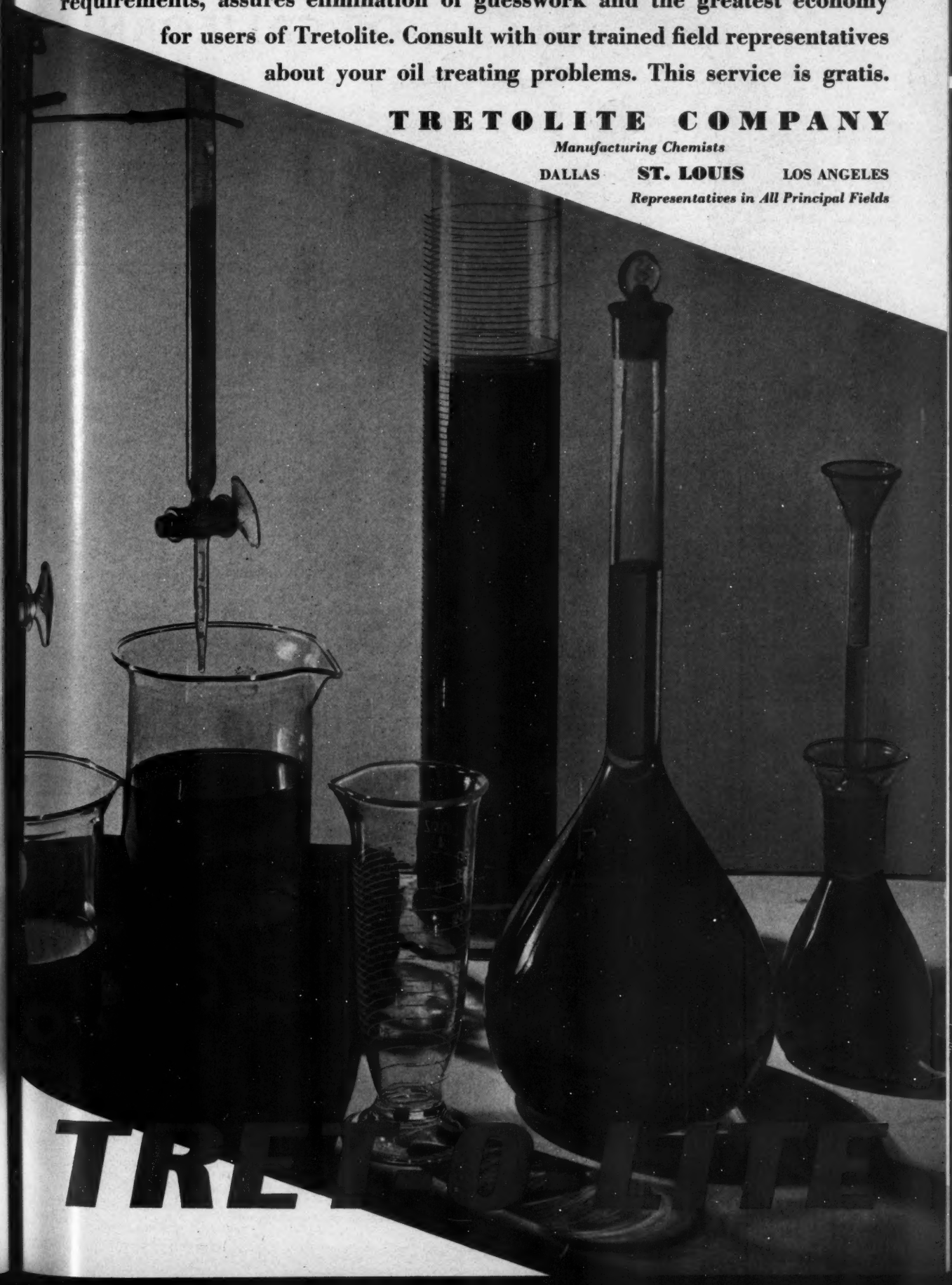

*Growing and Building with the West . . .*

# STANDARD OIL COMPANY
## OF CALIFORNIA

A dingy, gas-lighted room over a provi... shop. Several desks and stools. Three ... employees. That was the early-day San F... cisco office of what is today the Standard ... Company of California. Here it is—with ... customer at the window. What a contrast ... today—with a constant stream of automo... biles driving in and out of Standard Stati... Inc. and Standard Oil Dealers.

## A NEGLECTED DISCOVERY
### *that became California's leading industry*

OVER the steep walls of Pico Canyon, in southern California's Santa Susana Mountains, clambered the Mexican sheepherder, Ramon Perea—tracking a deer.

Suddenly, his boots mired in soggy ground. He looked down on a seepage of something black and sticky. Curious—he filled his canteen.

To San Fernando Mission—a center of learning in this year of 1860—he carried his find. "Petroleum"—the first discovered in California—said Dr. Gelsich, a guest from the East. Perea staked out a claim. But nothing was done about it.

For fifteen years rumors of oil in California filtered eastward. In quest of it, in '75, westward came D. G. Scofield. Up and down Pico Canyon he searched. Convinced that oil existed there he drove to San Francisco—where, two years before, the Anglo Bank had opened for business.

The mayor of the city, among others, joined him in the formation of the California Star Oil Works Company—and the first real attempt to uncover California oil was on.

#### First Production of Oil in California

Around Pico Canyon they gathered saplings and rocks. Made them into crude equipment — and started drilling. Within a month they were down 30 feet. Oil was tapped—and Pico No. 1 flowed with the first commercial production California had ever known. Other wells were drilled.

Two refineries were built—the first in California. One with two small boilers, near the present town of Newhall. Another near San Buenaventura. Combined they refined 60 barrels a day.

The venture proved too costly. So—operations were suspended.

Back to San Francisco drove Scofield. Not to be discouraged, he made plans for a second attempt. After several years new funds were gathered. In '79 the Pacific Coast Oil Company was formed.

More efficient methods were used. Pipe lines were laid. Tank cars carried the crude over the recently built railway line from Los Angeles to San Francisco, to the new refinery at Alameda Point, in Alameda County. A tank steamer went into service, too.

Again disappointment! All attempts to refine the California crude into a satisfactory kerosene failed. And kerosene, for "coal oil" lamps, was the principal use for petroleum. Hence, the company had no market for its crude.

#### Standard Opens Market for California Oil

For fifteen years Scofield had labored—without success. But help was right around the corner. The Standard Oil Company, which in '85 had opened a West-Coast sales office in San Francisco, put its research experts on the problem.

It found the answer in 1890—a method for refining a suitable kerosene from the California crude had been discovered. It offered to buy the entire output of the Pacific Coast Oil Company.

A new century dawned. The young West was growing up. More and more kerosene, axle grease, and harness oil were being sold. Standard Oil needed more crude oil supplies. So it bought the Pacific Coast Oil Company and ventured into the production of California petroleum.

Burst the era of the horseless carriage—and a revolutionary change in American life. Automobile registrations passed the hundred-thousand mark in '06. Jumped to a million seven years later. Mounted to two million in another two years.

Roads were improved—new ones built. Automobiles came down in price—and into universal use. The demand for gasoline and lubricants, to keep them running, increased at a terrific rate.

The oil industry was hard pressed to keep up—to unearth new crude oil supplies, refine them into gasoline and lubricants, and distribute them to the constantly increasing millions of new motor cars and trucks.

In little more than two decades, therefore, the automobile made petroleum California's leading industry. And the Standard Oil Company of California became an organization of more than 19,000 employees and over 70,000 stockholders.

Today—one of the largest oil companies in the world—it produces over thirty-five million barrels of crude oil a year.

Three huge refineries, with a combined capacity of 82,000,000 barrels, turn out over five hundred petroleum products.

Hundreds of miles of pipe lines connect the oil fields and refineries.

Tank ships, a whole fleet of them, carry oil up and down the Pacific Coast, to the eastern ... board and to foreign lands.

Hundreds of steel railway tank cars, and th... sands of huge motor-driven tank trucks, carry... products to distributors in city and village, ... mountain and desert.

Now — at Standard Stations, Inc., Authori... Distributors and Standard Oil Dealers—Stand... Oil products are available wherever you ... throughout the Pacific West.

*The Anglo California National Bank salutes the of... and the thousands of employees and stockholders o... Standard Oil Company of California who are primi... to carry on and blaze the trails into the new ar... progress.*

**The 66-year growth of the Anglo California National Bank, which was organized in 1873, parallels that of the vast majority of the outstanding business institutions of the West; many of whom we have been privileged to serve over a long period of their history. One of these is the Standard Oil Company of California.**

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### THE PROBLEMS OF EACH WELL BEFORE CEMENTING STARTS

Gazing into a crystal ball to get the "low-down" on what to expect for the present and future may be okay for some things—but not for cementing. You've got to KNOW the problems of each oil well before cementing starts. Nothing can be left to guesswork.

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